THE JOURNAL OF FINANCE • VOL. LX, NO. 6 • DECEMBER 2005

On the Benefits of Concurrent Lending and Underwriting

STEVEN DRUCKER and MANJU PURI*

ABSTRACT

This paper examines whether there are efficiencies that benefit issuers and underwriters when a financial intermediary concurrently lends to an issuer while also underwriting its public securities offering. We find issuers, particularly noninvestment-grade issuers for whom informational economies of scope are likely to be large, benefit through lower underwriter fees and discounted loan yield spreads. Underwriters, both commercial banks as well as investment banks, engage in concurrent lending and provide price discounts, albeit in different ways. We find concurrent lending helps underwriters build relationships, increasing the probability of receiving current and future business.

FOR MANY YEARS, THE 1933 GLASS-STEAGALL ACT prevented commercial banks from underwriting corporate bonds and equities. Due to the relaxation and recent repeal of the Act, many commercial banks have acquired investment banks or developed investment banking capabilities internally to create universal banks that can offer an array of financial services.

The entry of commercial banks into underwriting markets has increased the potential for financial institutions to offer both lending and underwriting services. In particular, it has become increasingly common for financial intermediaries to provide loans to a firm while also underwriting the firm's public securities. In fact, concurrent lending and underwriting has increased substantially over time—in 1994, only 1% of seasoned equity issuers received a loan from their underwriter at around the time of issuance, but by 2001, over 20% of all deals were concurrent. The movement toward concurrent lending and underwriting raises a host of interesting questions. First, why are deals concurrent?

*Drucker is from the Graduate School of Business, Columbia University. Puri is from the Fuqua School of Business, Duke University and NBER. Puri is grateful to the Sloan Foundation for partial funding of this research. This paper was circulated earlier under the title "Tying knots: Lending to win equity underwriting business." We thank James Booth, Mark Flannery, Jean Helwege, Jianping Qi, Tim Loughran, Rob Stambaugh (the editor), Steven Ongena, Andy Winton, an anonymous referee, and seminar participants at the Board of Governors, Washington D.C., the Federal Reserve Bank of San Francisco, Indiana University, INSEAD, London Business School, Stanford Graduate School of Business, the 2003 Financial Management Association International and Annual Meetings, the 2003 Federal Deposit Insurance Corporation Conference on Finance and Banking, the 2004 American Finance Association Meeting, the 2004 International Industrial Organization Conference, the 2004 Federal Reserve Bank of Chicago Conference on Bank Structure & Competition, and the 2004 Financial Intermediation Research Society Conference on Banking, Insurance, and Intermediation.

Are there efficiencies resulting from offering lending and underwriting services at the same time? Concurrent deals might allow for potential efficiency gains due to informational economies of scope that can result from the bank jointly delivering services and using the same client-specific information for multiple purposes (see, e.g., Benston (1990), Saunders and Walter (1994)). Therefore, concurrent lending and underwriting might be useful in cases in which there are large potential economies of scope from combining lending and underwriting. This would suggest that certain kinds of deals are concurrent but not others. Second, who benefits from concurrent lending and underwriting? Lower costs could arise due to informational economies of scope, and issuers could benefit if the bank passes along these savings. For the underwriter, providing concurrent lending and underwriting services might help build relationships that improve the probability of securing current and future business from the firm. Third, do the benefits from concurrent lending and underwriting vary by the type of underwriter involved in the transaction? It is possible that commercial banks are able to generate larger economies of scope than investment banks due to their well-established lending businesses, and therefore, there may exist differences in concurrent deals that are underwritten by investment banks as opposed to commercial banks.

In this paper, we address these issues empirically by studying instances in which underwriters concurrently lend to firms and underwrite these firms' seasoned equity offerings (SEOs). To tackle these questions, we use a unique data set that is carefully assembled from multiple databases and augmented by hand-collected data. We gather data on seasoned equity issuers, including each firm's credit rating, stock returns, issuance history, and lending history. We identify prior underwriting and lending relationships between each issuer and potential underwriter, as well as each underwriter's ranking, level of analyst coverage, and quality of analyst coverage. Further, we collect data on underwriter fees, loan pricing, and lending terms.

We find that there is a distinct profile of issuers that are involved in concurrent deals. In the majority of concurrent deals, the firms are highly leveraged and noninvestment-grade rated. One explanation for this is that for lower rated and highly leveraged firms, there are larger potential efficiency gains that arise due to informational economies of scope from combining lending and underwriting. Therefore, concurrently offering lending and underwriting for these issuers could produce substantial benefits. To study whether issuers actually benefit from the concurrent offering of services, we examine the impact on issuers' financing costs. Our results suggest that concurrent lending and underwriting lowers issuers' financing costs in two ways: (i) a reduced underwriter fee for the equity offering and (ii) discounted yield spreads of concurrent loans as compared with "matched" nonconcurrent loans. Interestingly, we find that the cost reductions are more pronounced among issuers that are noninvestment-grade rated, for whom the expected informational economies of scope are relatively large. Further, concurrent deals where the firm and underwriter have a prior lending relationship produce larger underwriter fee reductions, which is again consistent with the existence of scope economies between lending and

underwriting. In fact, prior lending relationships, in general, are associated with significantly lower underwriter fees.

To ensure that matching biases are not driving the yield spread discount, we use the econometric techniques developed by Heckman, Ichimura, and Todd (1997, 1998). These econometric methods effectively take into account the fact that the characteristics of concurrent loans may differ significantly from nonconcurrent loans and ensure that such observed differences are not driving the results. Using a variety of matching models, we confirm that concurrent loans are significantly cheaper than comparable loans.

To examine whether underwriters benefit from offering loans at the same time as an equity issuance, we look at the impact of concurrent deals on the underwriter's relationship with the firm. In particular, we investigate whether the same bank is selected for current and future equity underwriting mandates. We find that lending at the time of a seasoned equity issuance significantly increases the probability of securing current equity underwriting business. Concurrent lending is an important factor in the selection of an underwriter both when firms and underwriters have not interacted through previous lending transactions and also when they do have a prior lending relationship. We also find that issuers that have received a concurrent loan during a previous SEO return to the equity market more frequently than nonconcurrent issuers and that issuers who were involved in a prior concurrent deal with an investment bank underwriter are more likely to keep the same underwriter. The significant effects of concurrent lending on an underwriter's ability to generate both current and future underwriting business hold even after controlling for issuer characteristics and other factors that are likely to affect underwriter selection, such as underwriter reputation, prior relationships, and the level and quality of analyst coverage provided by underwriters. Further, our estimations show that prior lending relationships are important factors in determining underwriter selection in both current and future equity offerings. These results are consistent with concurrent loans, and more generally, the use of lending to help build relationships that increase an underwriter's expected revenues.

Lastly, we examine whether the benefits from concurrent deals vary by the type of underwriter involved in the transaction. Interestingly, while commercial banks are well positioned to offer lending and underwriting services concurrently due to their existing lending businesses, we discover that investment banks underwrite a significant portion of concurrent deals. This suggests that investment banks have developed the organizational infrastructure to lend and is consistent with there being potential gains from a single entity offering both lending and underwriting services.[1] Our results thus indicate that commercial banks and investment banks both compete for concurrent

[1] For example, Morgan Stanley participated in a $6.5 billion bank loan for Lucent Technologies and was subsequently awarded the role of underwriter on Lucent's spinoff of Agere Technologies (see Smith (2001a)). Moreover, investment banks are increasing their lending capacity, with Merrill Lynch, Lehman Brothers, and Morgan Stanley forming bank subsidiaries (see Smith (2001b)).

deals; however, they seem to compete through different components of the concurrent deals—commercial banks are more likely to offer discounted yield spreads on concurrent loans, while investment banks are more likely to discount the underwriter spread for the SEO. This is consistent with each type of underwriter competing more aggressively in its area of expertise and in the area in which it is more likely to generate future business: investment banks discount underwriter spreads and receive more future underwriting business; commercial banks discount loan yield spreads, which is consistent with establishing a lending relationship that helps generate future banking business.

This paper adds to the growing literature on how underwriters and issuers associate with each other. An important question is what determines the pairing of firms and underwriters for current as well as future deals? Studies suggest that underwriter reputation is an important determinant of the choice of underwriter (Booth and Smith (1986), Carter and Manaster (1990)), and high-quality issuers are more likely to associate with high-quality underwriters (Fernando, Gatchev, and Spindt (2005)). Underwriter capability in terms of all-star analyst coverage has been found to be important in affecting investment banking deal flow (Clarke et al. (2003), Corwin and Schultz (2005)) and for switching from one underwriter to another (Krigman, Shaw, and Womack (2001)), though there is little evidence to suggest that aggressive analyst recommendations increase the bank's probability of winning an underwriting mandate (Ljungqvist, Marston, and Wilhelm (2004)). In this paper, we find that concurrent lending as well as prior lending by the underwriter to the firm significantly affects firm–underwriter pairings and the pricing of underwriting services. Lending activities are important not just for current firm–underwriter association but also for future transactions and help create durable relationships that can benefit the issuer through lower financing costs.[2] Our findings also underscore that firm–underwriter pairings can differ by underwriter type and not simply by underwriter reputation and analyst coverage, as we find important differences between commercial bank and investment bank underwriters.

This paper also contributes to the literature on universal banking and the implications of allowing banks to underwrite securities. Regulators have recently raised questions on the firm-level and competitive effects of the relaxation and repeal of the Glass-Steagall Act (see, e.g., Berger, Demsetz, and Strahan (1999), Santomero and Eckles (2000)). Allowing banks to both lend and underwrite raises many concerns, including the potential for banks to engage in tying practices, where financial institutions alter the pricing or provision of credit based on a firm's decision to use the bank's investment banking services.[3] Since it is illegal for commercial banks to tie lending to underwriting services, explicit

[2] See also Ljungqvist et al. (2004) for additional sources of durability in bank–issuer relationships.

[3] U.S. House Representative Dingell highlights some regulatory concerns in a letter to Chairman Greenspan and Comptroller Hawke (see Dingell (2002)).

agreements are rarely found.[4] However, to the extent that concurrent lending and underwriting proxies for implicit agreements between underwriters and firms, our results suggest that firms actually benefit from using the same underwriter to arrange both of the concurrent transactions. Regarding the entry of commercial banks into underwriting, the theoretical literature has examined the potential for commercial banks and investment banks to coexist, as well as the implications of such a scenario (see, e.g., Boot and Thakor (1997), Kanatas and Qi (1998, 2003), Puri (1999), Rajan (2002), Stefanadis (2004)). However, the possibility that investment banks might respond by expanding into lending activities has generally not received much attention. Our results bring to light some similarities and differences in the ways in which investment banks and commercial banks compete for underwriting business. We also add to the evidence on implications of combining lending with underwriting. Much of the empirical literature that examines when banks lend and underwrite investigates the effect of bank lending, and the private information contained therein, on the banks' underwriting of public securities.[5] These effects are ascertained through the pricing of underwritten securities (see, e.g., Puri (1996), Gande et al. (1997), Yasuda (2005), Benzoni and Schenone (2004)) or through long-run performance (see, e.g., Ang and Richardson (1994), Kroszner and Rajan (1994), Puri (1994)). An important but unexplored issue is the reverse question—how do potential underwriting opportunities affect banks' lending, and how does this in turn affect the financing cost of the issuing firm? This paper provides a first step in addressing this question.

The remainder of the paper is organized as follows. Section I describes the data and our sample selection process. We present the major empirical findings in Section II. Section III concludes.

I. Data and Sample Selection

We attempt to capture instances in which a financial institution lends to a firm and concurrently underwrites its public security issuance. The definition that we adopt is if the firm receives a loan from the underwriter of the SEO

[4] Section 106 of the Bank Holding Company Act Amendments of 1970 prohibits a bank from explicitly extending credit or varying the terms of credit on the condition that a customer purchase another product or service from the bank or its affiliates. However, the Federal Reserve recently stated that the laws "do not prohibit a bank from granting credit or providing any other product to a customer based solely on a desire or a hope (but not a requirement) that the customer will obtain additional products from the bank or its affiliates in the future." Also, clients are free to use "their own bargaining power" to seek a bundle of banking services. For more information, see Michaels and Silverman (2003).

[5] In related literature, James (1987), Lummer and McConnell (1989), Best and Zhang (1993), and Billett, Flannery, and Garfinkel (1995), among others, find that new loans, loan renewals, and lender identity carry (positive) private information to the outside equity market about a borrowing firm's financial condition. See James and Smith (2000) for a comprehensive review of the past and recent research on the special nature of bank loan financing. This literature examines the effect of bank lending absent an underwriting role for the bank.

Table I
Concurrent Deals, by Year

This table presents the percentage of seasoned equity offerings (SEOs) that are concurrent deals. A concurrent deal is any SEO in which the underwriter provides a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO.

Year	1994	1995	1996	1997	1998	1999	2000	2001[a]
Number of SEOs	363	493	596	515	340	389	375	86
Number of concurrent deals	5	5	19	48	37	52	27	18
% Concurrent deals	1.38	1.01	3.19	9.32	10.88	13.37	7.20	20.93

[a]Through May 31.

between 6 months prior to and 6 months after the SEO, we classify the loan as a "concurrent loan" and the SEO as a "concurrent deal." As a robustness check to this definition, we also run our estimations where we define concurrent loans to be those loans that were originated between 3 months prior to and 3 months after the SEO. This sample produces qualitatively similar results.

We select our sample period based on the following factors. First, we hope to capture an active period of concurrent lending and underwriting. Table I shows that concurrent deals were nearly nonexistent before 1996 and with the exception of the year 2000, the proportion of concurrent deals increases each year. The decline in concurrent deals in the year 2000 may be due to a noticeable decline in telecom and cable SEOs, which account for around one third of all concurrent deals, and a very high proportion of technology offerings, which account for only a small percentage of concurrent deals. Second, since we will be examining whether the issuers proceed with a subsequent SEO, we must provide enough time to capture the decisions of end-of-sample issuers. Based on these considerations, we define our sample period as January 1, 1996 through May 31, 2001.

We construct a unique database using eight different data sources and hand-collected data. All variables are defined in detail in Appendix A. Data on SEOs comes from Thomson Financial's SDC *Platinum* United States New Issues database, from which we download underwritten, seasoned, U.S. common stock issues. Since we wish to study industrial firms, we remove financial firms (companies with a one-digit SIC code of six). The sample consists of 2,301 issues. We hand match, by issuer name, each of the 2,301 issuers to the Loan Pricing Corporation's (LPC) *DealScan* database to identify whether the firm received a concurrent loan from their underwriter, and in doing so, we identify whether the SEO is a concurrent deal.[6] There are 201 concurrent deals in the sample and 2,100 nonconcurrent deals.

[6] LPC *DealScan* collects its loan data from SEC filings, and it receives data from large loan syndicators and from a staff of reporters. As such, *DealScan* is well suited to studying the borrowing activity of companies with public equity and debt. Since all of the companies in our sample have public equity, we should observe the vast majority of their lending activity. *Dealscan* has been used in previous studies for many purposes, including examining the effect of lending on bond yield spreads (see, e.g., Gande et al. (1997)) and bank effects in lending rates (Hubbard Kuttner, and Palia (2002)).

We classify each underwriter as an "investment bank" or a "commercial bank" based on the status of the parent/holding company of the underwriter at the time of the issue.[7] Due to the many mergers and acquisitions in the financial sector, we use the mergers and acquisitions database from SDC *Platinum* to aid in classification. For example, NationsBank acquired Montgomery Securities on October 1, 1997. Montgomery Securities is classified as an investment bank prior to October 1, 1997, but after October 1, 1997, we classify it as a commercial bank. Commercial banks underwrote 91 concurrent SEOs and 591 nonconcurrent SEOs, while investment banks underwrote the remaining 110 concurrent SEOs and 1,509 nonconcurrent SEOs.

As we study how concurrent lending and underwriting affect the pricing of bank services and the ability of the underwriter to generate equity underwriting business, we need to control for factors that may alter fees, pricing, or the likelihood that an issuer selects an underwriter. Prior underwriting relationships are likely to be important in both the selection of a bank and the pricing of banking services (see, e.g., Baker (1990), James (1992), Crane and Eccles (1993), Ljungqvist et al. (2004)). Furthermore, it is possible that prior lending relationships could also influence underwriter selection and the pricing of services. In particular, if there are economies of scope in lending and underwriting, then a prior lending relationship may result in a reduced underwriter fee or other pricing differences. When identifying prior lending and underwriting relationships, we account for mergers between potential underwriters. For example, Fleet Bank merged with BankBoston/Robertson Stephens on October 1, 1999. When tracking relationships, we assume that Fleet Bank acquired all of BankBoston's and Robertson Stephens' prior lending and underwriting relationships. From SDC *Platinum*, we identify 90 concurrent issuers and 830 nonconcurrent issuers that use an underwriter that had underwritten a prior equity offering. From *DealScan*, we identify 83 concurrent issuers and 103 nonconcurrent issuers that have a prior lending relationship with the selected underwriter.

Previous research indicates that we need to incorporate the reputation of the underwriter, the level of analyst coverage, and the quality of analyst coverage into our models because these factors are likely to affect the firm's decision to select an underwriter or to switch underwriters in the future. We capture the influence of reputation through the underwriter's market share. For each year, we compute each underwriter's SEO market share by adding the principal amounts of all SEOs in which the bank was the underwriter and dividing this total by the principal amounts of all SEOs during the year. If a merger between underwriters occurred during the year, we use the combined market share of the underwriters. We rank the underwriters on a yearly basis, based

[7] We do not separate commercial banks that internally developed investment banking capabilities from those that acquired investment banks because almost all of the commercial banks developed underwriting operations by acquiring investment banks. Chaplinsky and Erwin (2001) note that for commercial banks who developed underwriting capabilities internally, only JP Morgan acquired market share in equity underwriting that is above 0.02% during the post-1996 period.

on the market share in the previous year.[8] For example, Goldman Sachs had the highest market share in 1995, so in our models, issuers who have an SEO in 1996 consider Goldman Sachs to be the top-ranked underwriter.

We measure the level of equity analyst coverage by using the I/B/E/S Detail History, which contains over 12 years of forecast changes and encompasses earnings estimates from more than 200 brokerage houses and 2,000 individual analysts. We match any estimate of earnings per share from any analyst in the I/B/E/S database to each of the 2,301 firms in our sample. If the underwriter provided an earnings recommendation within 1 year prior to the SEO date, then the underwriter provided "coverage." To capture the quality of analyst coverage, we use Institutional Investor magazine's All-America Research Team, which is published yearly and lists the top-three analysts in each sector. Since the report is published toward the end of each year, the inclusion of an analyst in the publication will most likely have its greatest impact on underwriter choice for issues that occur in the following year. As a result, for our purposes here, we say that the analyst (and corresponding underwriter) provided "all-star coverage" for a firm if the analyst is included in the All-America Research Team for the year prior to the equity issuance and provided an earnings recommendation within 1 year prior to the SEO date.

Since it is necessary to control for financial characteristics and risk factors, we obtain financial data for each firm from the Compustat Industrial Quarterly database from Standard and Poor's. The financial data used in this study correspond to the quarter in the year of the SEO issue date. The incorporation date for each firm is hand collected from Moody's/Mergent's Industrial and Transportation Manuals and Standard & Poor's Corporation Records. From the Center for Research in Security Prices daily stock database, we download daily return, price, and outstanding share data to compute the equity volatility and market capitalization for each firm.

For each of the 201 concurrent deals, we gather the associated lending facilities from LPC *DealScan.* There are 358 concurrent lending facilities. The sample of concurrent lending facilities consists of 116 notes, 111 revolving lines of credit, 99 term loans, seventeen 364-day facilities, 13 bridge loans, and 2 other types of facility.

To examine differences between concurrent loans and nonconcurrent loans, we create two separate samples. In the hand-matching sample, for each of the concurrent loan facilities, we create a control group of nonconcurrent loans that were originated at around the same time as the concurrent loan, with firms that belong to the same industry and have the same credit rating. We use all loans in *DealScan* that occur between 6 months prior to and 6 months after the term facility active date of the concurrent loan.[9] We keep only those nonconcurrent

[8] A simultaneity problem would arise if we used the market shares from the current year to rank the underwriters because when an issuer selects an underwriter in the current year, the decision simultaneously increases the underwriter's market share.

[9] We also use a sample of loans that occurs between 3 months prior to and 3 months after the SEO date. Results using this sample are similar and are not reported.

loans that have the same two-digit SIC code and credit rating as the corresponding concurrent loan. We remove any loan that is missing information for the all-in spread drawn and/or the length of the loan.[10] All bridge loans and loans with an issuer that is not rated are removed. This sample has 107 concurrent loans that can be matched to a similar nonconcurrent loan and comprises 56 revolving lines of credit, 40 term loans, ten 364-day facilities, and 1 other type of facility.

To construct the econometric-matching sample, we download all lending facilities in *DealScan* that occur between January 1, 1996 and May 31, 2001. We remove any facility that is missing information for the all-in spread drawn and/or the length of the facility, and we remove any facility such that the borrower is a financial firm (companies with a one-digit SIC code of six). As before, all bridge loans and loans to not-rated borrowers are excluded. This sample consists of 166 concurrent loans that can be matched to a sample of 6,919 nonconcurrent loans. Seventy-four revolving lines of credit, 77 term loans, fourteen 364-day facilities, and 1 other type of facility form the sample of 166 concurrent loans. Seventy-nine of the 166 concurrent loans are from commercial bank underwriters, while investment bank underwriters provide the remaining 87 concurrent loans.

In addition, we classify 340 lending facilities as "other issuance period loans," which are loans to an issuer of an SEO that are originated between 6 months prior to and 6 months after the SEO, where the lender could have been selected to underwrite the SEO but is not provided with underwriting responsibilities. Of the 6,919 nonconcurrent loans in the econometric-matching sample, 145 lending facilities are designated as other issuance period loans.

II. Methodology and Results

As shown in Table I, concurrent deals increased over time from about 1% in 1994 to over 20% in 2001. However, before 1996, while concurrent deals were nearly nonexistent, many issuers received loans from another bank at about the same time as the issuance of public securities.[11] Over time, issuers have shifted from using a commercial bank for lending and an investment bank for equity underwriting to employing a single entity for both of these transactions.

Table II reports summary statistics for the concurrent and nonconcurrent SEO samples. Concurrent issuers are highly leveraged, with debt-to-equity ratios that are, on average, five times higher than nonconcurrent issuers. Furthermore, concurrent borrowers have low credit ratings, with 71% of investment bank concurrent deals and 60% of commercial bank concurrent deals for junk-rated issuers, and another 12% of investment bank deals and 27% of

[10] The all-in spread drawn is the rate the borrower pays to the lender each year for each dollar drawn off the credit line (inclusive of fees), quoted in basis points over LIBOR.

[11] In 1994, over 30% of SEO issuers received a loan from some bank within a period of 6 months before and 6 months after the issuance, even though only 1.4% of these loans came from the underwriter of the issuance.

Table II

Univariate Tests for Differences in the Sample of SEOs between January 1996 and May 2001

This table tests for differences between concurrent deals and nonconcurrent deals and for differences between investment bank concurrent deals and commercial bank concurrent deals. Panels A and C use a difference in means t-test and Wilcoxon rank test. A concurrent deal is any seasoned equity offering (SEO) in which the underwriter provides a loan to the issuer between six months prior to the SEO and six months after the SEO. The underwriter is an IB (CB) if the parent or holding company of the underwriter is an investment bank (commercial bank) at the time of the SEO. The variables are defined as follows: USPREAD is the underwriter spread, expressed as a percentage of the principal amount; LNSIZE is the logarithm of the SEO principal amount, expressed in millions of dollars; DE-LTDEBT is the long-term debt to common equity ratio in the quarter of the SEO; AGE is the firm's age, measured in years; PRIORLEND is one if a loan between the underwriter and the issuer was originated at any time before six months prior to the SEO; PRIORUND is one if the underwriter had been the underwriter on any prior equity offering by the issuer; COVERAGE is one if the underwriter had provided an earnings per share estimate for the firm within the year prior to the SEO; and, ALLSTAR is one if COVERAGE is 1 and the analyst was ranked as an all-star by Institutional Investor magazine for the year prior to the SEO. A firm has an issuer rating of IGRADE if it is rated AAA, AA, A, or BBB by Standard & Poor's in the quarter of the SEO. A firm has an issuer rating of JUNK if it is rated BB, B, CCC, CC, or C by Standard & Poor's in the quarter of the SEO. All variables are explained in detail in Appendix A. ***, **, * indicates significantly different than zero at the 1%, 5%, and 10% level, respectively.

Panel A: Concurrent vs. Nonconcurrent Deals—Issuer and Issuance Variables

Variable	Concurrent Deal Mean	Nonconcurrent Deal Mean	*T*-Ratio	Wilcoxon Test *p*-Value
USPREAD	4.33	5.11	−8.63***	0.0000***
LNSIZE	5.09	4.28	9.94***	0.0000***
DE-LTDEBT	2.57	0.55	2.96***	0.0000***
AGE	21.78	17.87	2.12**	0.1845

Panel B: Concurrent vs. Nonconcurrent Deals—Relationship Variables

Variable	Percent of Concurrent Deals	Percent of Nonconcurrent Deals
CB	45.3	28.1
IB	54.7	71.9
PRIORLEND	41.3	4.9
PRIORUND	44.8	39.5
COVERAGE	77.1	63.0
ALLSTAR	21.4	12.9

Panel C: IB vs. CB Concurrent Deals—Issuer and Issuance Variables

Variable	IB Concurrent Deal Mean	CB Concurrent Deal Mean	*T*-Ratio	Wilcoxon Test *p*-Value
USPREAD	4.25	4.43	0.98	0.2792
LNSIZE	5.28	4.92	2.24**	0.0110**
DE-LTDEBT	2.83	2.31	0.39	0.4189
AGE	20.50	23.35	0.79	0.1148

(*continued*)

Table II—*Continued*

Panel D: IB vs. CB Concurrent Deals—Relationship Variables		
Variable	Percent of IB Concurrent Deals	Percent of CB Concurrent Deals
PRIORLEND	36.4	47.3
PRIORUND	48.2	40.7
COVERAGE	78.2	75.8
ALLSTAR	23.6	18.7
Panel E: IB vs. CB Concurrent Deals—Issuer Rating		
Variable	Percent of IB Concurrent Deals	Percent of CB Concurrent Deals
IGRADE	17.27	13.19
JUNK	70.91	60.44

commercial bank deals involving issuers that are not rated. Since duplication of information is particularly costly for risky firms because they are subject to extensive due diligence in both lending and underwriting, concurrent lending and underwriting can be extremely beneficial for these issuers because a single bank can use the collected information for both transactions. In addition, for lower rated and highly leveraged firms, debt has similar characteristics to equity. As a result, information gathered in the lending process will be relevant to the equity issuance that may enhance the certification ability of the underwriter. Therefore, economies of scope are likely to be high for these firms, and concurrent lending and underwriting may be an efficient response to the ability of the banks to use information across product lines.

Commercial banks are underwriters on 45% of concurrent deals and investment banks underwrite the remaining 55% of concurrent deals. Also, commercial banks and investment banks provide concurrent loans to similar clients. These are interesting facts, which suggest that investment banks have now developed the organizational structure to lend. This expansion into lending by investment banks is consistent with there being potential gains from a single entity offering both lending and underwriting services.

A. Equity Underwriter Spreads

We wish to determine whether concurrent lending and underwriting lowers issuers' financing costs. One possibility is that the firm pays a lower fee to the bank for underwriting its equity offering. An underwriter could charge a lower fee in a concurrent deal because the bank may face lower underwriting costs due to informational economies of scope that arise from the joint delivery of services and the reusability of information gathered during the lending process. We examine differences between concurrent and nonconcurrent underwriting fees by analyzing the underwriter spread, which is the compensation paid to the underwriter for selling the firm's security issue, expressed as a percent of the

capital raised. Consistent with the existence of scope economies, the univariate descriptive statistics in Table II, Panel A, indicate that the average underwriter spread of concurrent SEOs is 78 basis points lower than the mean underwriter spread of nonconcurrent SEOs, a difference that is significant at the 1% level.

A.1. U-Shaped Underwriter Spreads

The initial evidence indicates that concurrent issuers receive lower underwriter spreads. We wish to see if this result withstands a multivariate specification. Following Altinkilic and Hansen (2000), we estimate a model of the underwriter spread that can be a U-shaped function of the amount of new capital raised. Theoretically, a U-shaped function could arise because fixed costs cause scale economies initially but as issue size increases, diseconomies of scale arise in the spread due to rising placement costs. Altinkilic and Hansen find strong evidence of U-shaped curves in a sample of 1,325 SEOs from 1990 through 1997.

As a model for the underwriter spread, we use Altinkilic and Hansen's (2000) expanded spread model in which the underwriter spread is the sum of a fixed cost and a variable cost component. In order to generate U-shaped spreads, the variable cost component must be allowed to rise over a relevant range of proceeds. This condition is satisfied by dividing the SEO principal amount by the firm's equity market capitalization, which effectively holds the firm size fixed as the size of the offering expands, thereby allowing variable costs of underwriting to increase at an increasing rate. We control for the volatility of equity returns because higher volatility can cause more uncertainty, which may be reflected in a higher underwriter spread. The model captures any variation in underwriter costs that is due to the volume of issuance in the seasoned equity market.

We extend the model to include variables to capture concurrent lending and prior relationships. Since an existing lending relationship can lower setup costs and provide the bank with access to additional information, concurrent deals involving prior lenders may be less costly. To capture this potential effect, we control for interactions between prior lending and concurrent lending. A negative coefficient on the concurrent lending variables would be consistent with the existence of scope economies. We estimate two variations of the expanded spread model—in the first model, we do not consider differences between investment banks and commercial banks; we relax this restriction in the second model. Further, we examine differences between noninvestment-grade and investment-grade issuers. Since economies of scope are likely to be high for noninvestment-grade firms, we expect discounts to be concentrated among these deals.

A.2. Results

Results of ordinary least squares regressions are presented in Table III. We find support for U-shaped spreads. As more capital is raised, the variable cost increases. As expected, higher stock return volatility increases the variable

Table III

Underwriter Spread Regressions

This table provides ordinary least squares estimates of a model of the underwriter spread that can be a U-shaped function of the amount of new capital raised. The model is based on Altinkilic and Hansen's (2000) expanded spread model. The dependent variable is USPREAD, the underwriter spread, expressed as a percentage of the principal amount. The independent variables are as follows: CONCLOAN is a dummy variable that equals 1 if the underwriter provides a loan to the issuer between 6 months prior to the seasoned equity offering (SEO) and 6 months after the SEO *and* the underwriter has never provided a loan to the issuer in the past; CONCPLEND is a dummy variable that equals 1 if the underwriter provides a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO *and* the underwriter provided a loan to the issuer prior to 6 months before the SEO; PRIORLEND is a dummy variable that equals 1 if a loan between the underwriter and the issuer was originated at any time prior to 6 months before the SEO *and* the underwriter does not provide a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO; PRIORUND is 1 if the underwriter had been the underwriter on any prior equity offering by the issuer; IB (CB) is 1 if the parent / holding company of the underwriter is an investment bank (commercial bank); 1/SEOSIZE is the inverse of the principal amount of the equity offering, measured in millions of dollars; SEOSIZE/MKTCAP is the principal amount of the offering divided by the market capitalization of the issuer at the date of the SEO; VOL is the daily standard deviation of the issuer's common stock rate of return; MKTACT is the dollar volume of issuance in the U.S. SEO market for the 3 months prior to each offering; and, SICx are industry dummy variables, which are one if the firm has the corresponding one-digit SIC. All variables are explained in detail in Appendix A. In columns (1) and (4), we estimate the models using the full sample of issues. In columns (2) and (5), the sample is restricted to SEOs by noninvestment-grade issuers. Noninvestment-grade issuers are either not rated or have a Standard & Poor's long-term debt rating of BB, B, CCC, or CC in the quarter of the SEO. In columns (3) and (6), the sample is restricted to SEOs by investment-grade issuers. Investment-grade issuers have a Standard & Poor's long-term debt rating of AAA, AA, A, or BBB in the quarter of the SEO. Coefficients for the industry variables (SICx) are not reported. *T*-ratios are in parentheses. ***, **, * indicates significantly different than zero at the 1%, 5%, and 10% level, respectively.

	Full Sample (1)	Noninvestment-Grade (2)	Investment-Grade (3)	Full Sample (4)	Noninvestment-Grade (5)	Investment-Grade (6)
Intercept	4.247***	4.599***	3.439***	4.231***	4.565***	3.185***
	(33.12)	(35.74)	(7.38)	(31.57)	(34.28)	(5.64)
CONCLOAN	−0.182*	−0.179*	−0.034			
	(−1.74)	(−1.76)	(−0.11)			
CONCPLEND	−0.360**	−0.329**	−0.474			
	(−2.31)	(−2.26)	(−1.02)			
PRIORLEND	−0.360***	−0.358***	−0.069			
	(−3.04)	(−3.17)	(−0.23)			

(*continued*)

Table III—*Continued*

	Full Sample (1)	Noninvestment-Grade (2)	Investment-Grade (3)	Full Sample (4)	Noninvestment-Grade (5)	Investment-Grade (6)
PRIORUND	−0.217***	−0.263***	−0.028			
	(−4.19)	(−5.19)	(−0.17)			
IB				0.021	0.043	0.238
				(0.29)	(0.64)	(0.67)
IB × CONCLOAN				−0.263**	−0.343**	0.303
				(−2.00)	(−2.40)	(0.92)
CB × CONCLOAN				−0.070	0.022	−0.760
				(−0.43)	(0.17)	(−1.61)
IB × CONCPLEND				−0.440**	−0.413**	−1.382
				(−2.20)	(−2.44)	(−1.55)
CB × CONCPLEND				−0.321	−0.283	0.003
				(−1.43)	(−1.27)	(0.00)
IB × PRIORLEND				−0.324**	−0.328***	0.046
				(−2.49)	(−2.67)	(0.15)
CB × PRIORLEND				−0.454*	−0.427*	−0.441
				(−1.81)	(−1.84)	(−0.48)
IB × PRIORUND				−0.248***	−0.299***	−0.122
				(−4.39)	(−5.29)	(−0.72)
CB × PRIORUND				−0.135	−0.173**	0.178
				(−1.45)	(−2.02)	(0.42)
1/SEOSIZE	17.270***	15.377***	24.680***	17.259***	15.328***	24.783***
	(6.04)	(5.99)	(2.91)	(5.98)	(5.92)	(2.74)
SEOSIZE/MKTCAP	0.242	0.225	−0.049	0.241	0.223	−0.052
	(1.43)	(1.13)	(−0.37)	(1.42)	(1.12)	(−0.39)
VOL	12.274***	7.570***	17.273	12.226***	7.532***	18.625*
	(10.26)	(6.73)	(1.57)	(9.96)	(6.55)	(1.73)
MKTACT	−7.581**	−4.071	−2.042	−7.652**	−3.957	−2.173
	(−2.34)	(−1.44)	(−1.38)	(−2.36)	(−1.42)	(−1.49)
R^2	0.4029	0.4003	0.1644	0.4040	0.4026	0.2048

spread and there is a large fixed cost component to underwriter spreads. In the first column of Table III, we present the results of the model in which we do not consider differences in the fees charged by investment banks and commercial banks. The coefficients on the concurrent lending and the prior lending variables are all negative and significant. A concurrent loan without a prior lending relationship provides an 18-basis point reduction in the underwriter spread, which is significant at the 10% level. A prior lending relationship, both with and without a concurrent loan, translates into a 36-basis point reduction in the underwriter spread. On a $200 million equity offering, an 18-basis point reduction in the underwriter fee provides a cost savings of $360,000 to the issuer, while a 36-basis point decrease saves the issuer $720,000. These results are consistent with the existence of economies of scope.

As previously argued, economies of scope between lending and underwriting are likely to be pronounced when the issuer is junk rated or not rated. We restrict the sample of SEOs to include only junk-rated and not-rated issuers and display the results of the model in the second column of Table III. Consistent with the existence of informational economies of scope, we find that among these issuers, significant underwriter spread discounts are provided when the issuer receives a concurrent loan or has a prior lending relationship with the underwriter. In the third column of Table III, we present the results of the model in which we restrict the sample to include only investment-grade issuers. Among investment-grade issuers, for whom private information is likely to be less important, we do not find significant underwriter spread discounts. These results highlight that the underwriter spread discounts are driven by deals in which, ex ante, concurrent lending and underwriting is likely to be efficient.

The results in the fourth and fifth columns of Table III show that investment banks account for most of the concurrent lending and underwriting discount. For concurrent issuers, investment banks provide a discount of 26 basis points if no prior lending relationship exists and 44 basis points if there is a prior lending relationship, both significant at the 5% level. On a $200 million equity offering with an investment bank, on average the issuer saves $520,000–$880,000. For commercial bank underwritten issues, the coefficients for concurrent deals are negative but insignificant. It is interesting to note that both investment banks and commercial banks provide significant discounts in the underwriter spread to firms that do not receive a concurrent loan but with which a prior lending relationship is in place, which further supports the existence of informational economies of scope between lending and equity underwriting.

Overall, we find that concurrent deals have lower underwriter spreads than nonconcurrent deals and that concurrent deals such that there was a prior lending relationship in place receive a larger discount. Importantly, we find that the discounts are driven by deals that involve junk-rated and not-rated issuers, for whom economies of scope between lending and underwriting are likely to be large. Consequently, the results are consistent with the view that concurrent deals are an efficient response to the ability of banks to use information across product lines. We find additional support for the existence of economies of scope between lending and equity underwriting, as a prior lending

relationship translates into an underwriter spread discount. Further, we find that most of the underwriter spread discounts can be attributed to investment bank underwriters.

B. The Pricing of Concurrent Loans

We now study the pricing of concurrent loans to address two issues. First, we wish to determine whether there is additional evidence that concurrent lending and underwriting reduces issuers' financing costs. To examine this question, we compare the yield spreads of concurrent loans and nonconcurrent loans.[12] Lower yield spreads for concurrent loans would be consistent with the existence of informational economies of scope. Second, we wish to examine if the benefits provided to concurrent issuers vary by the type of underwriter. Considering the result from the last section in which we find that investment banks discount underwriter spreads, any differences between investment bank and commercial bank pricing of concurrent loans will provide insight into how these two underwriter types compete. Therefore, we compare the yield spreads of concurrent loans in which the lender is a commercial bank with concurrent loans from investment banks.

B.1. Hand Matching

To examine pricing differences between concurrent and nonconcurrent loans, we hand-match concurrent loans to nonconcurrent loans along four dimensions: (i) loan origination date; (ii) industry; (iii) credit rating; and (iv) length of the loan. Ideally, we would like to find a nonconcurrent loan that matches the concurrent loan on all four dimensions. However, it is unlikely that we will find an exact match. Instead, for each of the 107 concurrent lending facilities in the hand-matching sample, we select the nonconcurrent loan with the closest term length, given that the nonconcurrent loan was originated between 6 months before and 6 months after the concurrent loan origination date, and the nonconcurrent borrower belongs to the same industry and has the same credit rating as the concurrent borrower.[13] Therefore, any selected nonconcurrent loan will be an exact match on two of the four dimensions (industry and credit rating) and will have a very similar term length and loan origination date.

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

[13] We also restrict the selection of nonconcurrent loans to those that are originated between 3 months prior to and 3 months after the term facility origination date. The results are similar and are not reported. We match on the credit rating of the borrower at the loan origination date. If the bank acts rationally, it should consider the effect that the loan will have on the credit risk of the firm when determining the price and structure of the loan. Therefore, we also examine the credit rating of the firm at two quarters after the loan. In our sample of concurrent loans, only two rated borrowers had a credit rating change during the two quarters, so both measures of credit rating provide a nearly identical sample.

We examine the mean difference between concurrent and nonconcurrent loan yield spreads using three estimators.[14] The "12-month estimator" uses all matches in which the absolute value of the difference between the term lengths of the matched pair of loans is less than 12 months. The "6-month estimator" is the same as the 12-month estimator except that the difference cannot exceed 6 months. The "exact estimator" only includes matches such that each loan in a matched pair has the same term length. For all three estimators, on average, the concurrent loan yield spreads are more than 20 basis points lower than the matched nonconcurrent loan yield spreads, a significant difference at the 5% level.

B.2. Econometric Matching

There are a few problems with the hand-matching method. First, we match on only four dimensions and ignore variables that may be relevant in determining yield spread differences, such as the size of the lending facility and the type of lending facility. Second, for matching to occur, there must exist at least one nonconcurrent loan that meets these four criteria. As a result, we do not generate matches for all of the concurrent loans in our sample. To reduce these problems, we rely on econometric matching techniques that were developed by Rosenbaum and Rubin (1983) and extended by Heckman and Robb (1986) and Heckman et al. (1997, 1998).[15] In Appendix B, we provide a summary of these techniques and a detailed description of how we apply the methods to our data.

Essentially, instead of facing the difficult task of matching directly on multiple dimensions, econometric matching allows us to match nonconcurrent loans to concurrent loans based on a one-dimensional propensity score that is a function of the loans' observable characteristics. As a result, we effectively match loans based on many observable characteristics while not reducing the number of concurrent loans for which we can find matches. Furthermore, the methods take into account the fact that the characteristics of concurrent loans may differ significantly from nonconcurrent loans and ensure that such observed characteristics are not driving the results.

We choose to use econometric matching techniques instead of the alternative approach of employing a multivariate regression model because matching employs fewer restrictions than the regression approach, and many studies have confirmed that propensity score matching methods can allow for a more accurate analysis (see, e.g., Rubin (1997), Conniffe, Gash, and O'Connell (2000)). A key restriction in using multivariate regressions to study the pricing of loans is that the covariates are assumed to be linearly related to the yield spread.

[14] If multiple nonconcurrent loans share the closest term length to the nonconcurrent loan, we use the average yield spread of the nonconcurrent loans.

[15] Previous papers in economics and finance use the Heckman et al. (1997, 1998) matching methodology. McMillen and McDonald (2002) apply the method to study land valuation in a newly zoned city, while Dearden, Ferri, and Meghir (2002) and Blundell et al. (2000) use the matching methods to study the effect of education on wages. Bharath (2002) uses these methods to evaluate the agency costs of debt.

In the propensity score approach, the researcher does not need to specify the actual relation between yield spreads and the characteristics that can affect loan pricing.

In our models, the propensity score is a function of the firm's credit rating, the notional value of the loan facility, the term length of the loan, the type of lending facility, the year of the facility origination, and the firm's industry. Using propensity scores and econometric matching estimators, we calculate average yield spread differences between concurrent loans and matched nonconcurrent loans. Further, we split our sample to allow for a comparison of junk-rated concurrent loans with matched junk-rated nonconcurrent loans, and to enable concurrent loans to investment-grade-rated borrowers to be matched with nonconcurrent loans to similar investment-grade-rated borrowers. Also, we extend the methodology to capture differences between commercial bank concurrent loans and investment bank concurrent loans. We compare commercial bank concurrent loans to nonconcurrent loans by restricting the concurrent lending sample to include only commercial bank loans. Separately, we examine differences between investment bank concurrent loans and nonconcurrent loans.

B.3. Results

Each of the econometric matching estimators provides a sample of yield spread differentials, with each yield spread differential representing the discount (if negative) or premium (if positive) that a concurrent borrower pays. We calculate the sample average and standard error for the estimations and display the results in Table IV.

First, we provide evidence that is consistent with the existence of economies of scope in concurrent deals. As displayed in the first column of Table IV, all estimators indicate that concurrent loans have significantly lower yield spreads, with the average discount ranging between 9.97 and 14.81 basis points. On a $200 million, 6-year loan, a reduction of 9.97 basis points represents a present value savings of $770,000, while a 14.81-basis point reduction provides a present value savings of $1.15 million.[16]

We attempt to determine the effect of prior lending relationships on the yield spread differential between concurrent and nonconcurrent loans. For each estimator, we regress the sample of estimated yield spread differentials on a dummy variable that indicates whether the borrower of the concurrent loan has a prior lending relationship with the bank. Our results indicate that a prior lending relationship does not significantly affect the size of the discount.

Second, we find that the lower yield spreads on concurrent loans are concentrated among borrowers that have lower credit quality. The results in the second column of Table IV show that yield spreads on concurrent loans to junk-rated borrowers are discounted, on average, by between 12.10 and 15.96 basis points relative to matched nonconcurrent loans to junk-rated borrowers, and the discounts are strongly significant for all four estimators. In comparison,

[16] This calculation assumes a yearly discount rate of 15%.

Table IV

Estimated Mean Yield Spread Differences, in Basis Points

This table provides estimates of the mean difference between the yield spread (YSPREAD) of concurrent loans and other loans, using various estimators. YSPREAD is the rate that the borrower pays to the lender (inclusive of fees), quoted in basis points over LIBOR. Concurrent (other issuance period) loans are loans to the issuer of a seasoned equity offering (SEO) between 6 months prior to and 6 months after the SEO where the lender is (not, but could have been selected as) the underwriter of the SEO. We compute propensity scores, match concurrent loans with nonconcurrent loans using the propensity scores, and estimate the differences in yield spread between the two types of loans. We compute propensity scores using a probit model. The dependent variable is CONCURRENT, a dummy variable that equals 1 if the lending facility is a concurrent loan. The independent variables are as follows: RATING is the Standard & Poor's credit rating of a firm at the date of the loan identified through a numerical counterpart AAA = 1, AA = 2, A = 3, BBB = 4, BB = 5, B = 6, CCC = 7, CC = 8, C = 9; FACSIZE is the notional value of the loan facility, expressed in millions of dollars; LENGTH is the term length of the loan facility, measured in months; TYPE are dummy variables that indicate the type of loan, as classified by LPC *Dealscan*; YEAR are indicators for the loan year; and, INDUSTRY is a set of industry dummy variables based on two-digit primary SIC code. All variables are explained in detail in Appendix A. Estimators are nearest neighbor matching using n nonconcurrent loans (NEAR NEIGHBOR), and kernel-based matching techniques (GAUSSIAN and EPANECHNIKOV). The estimators are described in detail in Appendix B. For all estimations, we present the sample averages of yield spread differences. Column (1) presents results for the full sample of loans. Column (2) provides estimates for when only junk rated loans are included in the sample. Column (3) provides results for when only CB loans are included. Column (4) reports the difference between CB concurrent yield spread differences and other CB issuance period yield spread differences. We report t-ratios in parentheses, which are calculated using standard errors that are computed by bootstrapping with 50 replications. ***, **, * indicates significantly different than zero at the 1%, 5%, and 10% level, respectively.

Estimator	Concurrent and Nonconcurrent (1)	Junk-Rated Concurrent and Nonconcurrent (2)	CB Concurrent and Nonconcurrent (3)	CB Concurrent and Other CB Issuance Period (4)
NEAR NEIGHBOR	−14.811**	−13.690**	−22.713**	−28.422*
($n = 10$)	(−2.09)	(−2.23)	(−2.38)	(−2.92)
NEAR NEIGHBOR	−12.081**	−12.104**	−19.052**	−28.202**
($n = 50$)	(−2.38)	(−2.24)	(−2.31)	(−1.96)
GAUSSIAN	− 9.966*	−13.041**	−16.347**	−16.430
	(−1.93)	(−2.38)	(−2.23)	(−1.12)
EPANECHNIKOV	−14.772**	−15.959**	−21.223**	−26.409*
	(−2.27)	(−2.06)	(−2.57)	(−1.83)

we find that investment-grade borrowers do not receive significantly lower yield spreads on concurrent loans relative to matched nonconcurrent loan yield spreads. These results are consistent with economies of scope between lending and underwriting being more pronounced for issuers with lower credit ratings.

Third, we find that commercial banks provide cheaper loans to concurrent borrowers. In the third column of Table IV, we show that yield spreads on commercial bank concurrent loans are discounted by between 16.35 and 22.72 basis points relative to nonconcurrent yield spreads, and that the

differences are highly significant for all four estimators. On a $200 million, 6-year loan, a concurrent borrower earns a present value savings of between $1.27 and $1.76 million through a discounted loan yield spread that is provided by its commercial bank.[17] Again, the savings provided by commercial banks are pronounced among junk-rated borrowers. While commercial banks reduce concurrent loan yield spreads, we find that yield spreads on investment bank concurrent loans are insignificantly different from those of nonconcurrent loans.[18] Concurrent lending by commercial banks, as opposed to investment banks, largely drives the difference between the yield spreads of concurrent and nonconcurrent loans.

These results, in combination with the results from Section II.A., indicate that in comparison to similar nonconcurrent issuers and borrowers, concurrent issuers pay lower underwriter spreads on the SEO and receive lower loan yield spreads. Furthermore, we find that the cost reductions are large and significant for issuers who are not investment-grade rated. These results are consistent with the existence of informational economies of scope. In addition, the concentration of savings among these firms helps explain why all deals are not concurrent, as concurrent lending is economically justified only when there are sufficient informational economies of scope.

Interestingly, we find that the form of the savings depends on the type of bank that is involved in the transaction, with investment banks providing lower underwriter spreads on the equity offering and commercial banks providing lower loan yield spreads. These savings are economically substantive. As an illustration, concurrent issuers who use investment banks receive an average savings of between $520,000 and $880,000 on a $200 million equity offering. Those who use commercial banks receive an average saving of between $1.27 and $1.76 million on a $200 million, 6-year loan.[19]

B.4. Robustness—Other Issuance Period Loans

An additional concern is that concurrent issuers are simultaneously raising equity and receiving loans and may therefore differ from other issuers. To address this concern, within the sample of nonconcurrent loans, we identify other issuance period loans, which are loans to an issuer of an SEO that are originated between 6 months prior to and 6 months after the SEO, where the lender could have been selected to underwrite the SEO but is not provided with

[17] Again, this calculation assumes a yearly discount rate of 15%.

[18] In unreported estimations, we find that investment bank concurrent loan yield spreads are insignificantly discounted between 0 and 6 basis points relative to matched nonconcurrent loan yield spreads.

[19] In addition, we attempt to determine if concurrent issuers have significantly reduced financing costs for the entire transaction. For each concurrent deal, we create an updated underwriter spread by calculating the dollar value of savings or premium for each concurrent loan, adding this value to the dollar fee for the SEO, and dividing the total amount by the principal amount of the SEO. Unreported estimations of the underwriter spread models reveal that concurrent issuers receive significant savings on the entire transaction.

underwriting responsibilities.[20] We then compare concurrent loan yield spreads with other issuance period loan yield spreads to determine whether the results in Section II.B.3. are robust.

In Section II.B.3, we show that most of the discounting of concurrent loans comes from commercial banks. Hence, we compare commercial bank concurrent loans with other commercial bank issuance period loans. Extending the previously employed methodology, we match commercial bank concurrent loans to nonconcurrent loans as well as other commercial bank issuance period loans to nonissuance period loans by computing propensity scores and calculating yield spread differences.

We compute sample averages for the concurrent loan matched pairs and the other issuance period loan matched pairs and report the mean difference in the yield spread between the two groups in the fourth column of Table IV. The results of all four estimations indicate that commercial bank concurrent loans are discounted more than other commercial bank issuance period loans. On average, concurrent loan yield spreads are less than other issuance period loan yield spreads by 16.43–28.42 basis points, and the difference is significant when using three of the four estimators. Relative to loans provided by other commercial bank underwriters around the time of the SEO issuance, the discount that is provided by commercial banks to concurrent issuers remains significant.

C. Underwriter Relationships

In Sections II.A. and II.B., we find that the issuers who participate in a concurrent deal benefit from lower financing costs in the form of lower underwriter spreads and lower loan yield spreads. Here, we examine whether underwriters benefit from concurrent lending and underwriting. Underwriters may gain if this practice helps build relationships that improve the bank's chances of capturing current or future underwriting business. Hence, we first investigate whether providing a concurrent loan significantly increases the probability that the bank wins the current equity underwriting mandate. Then we investigate if concurrent lending and underwriting increases the likelihood that the bank will receive future underwriting business from the firm, thereby increasing expected future revenues.

C.1. McFadden's Choice Model

In this section, we study the influence that concurrent lending has on the likelihood that a bank is selected as the equity underwriter. We use McFadden's (1973) choice model to capture the effect.[21]

Each issuing firm i chooses an underwriter j from a set of J underwriters. The choice of underwriter will depend on the characteristics of the issuer and attributes of the underwriter. The utility of choice j is

[20] We also extend this sample to include loans from any bank, not just those who could be selected to underwrite the SEO. The results are qualitatively similar.

[21] See Greene (2000) for a discussion of models for choices between multiple alternatives.

$$U_{ij} = \alpha' \boldsymbol{w}_i + \beta' \boldsymbol{x}_{ij} + \varepsilon_{ij}, \tag{1}$$

where $\boldsymbol{w}_i$ is a vector of issuer characteristics and $\boldsymbol{x}_{ij}$ is a matrix of choice attributes. If the issuing firm makes a choice j, then we assume that U_{ij} is the maximum among the J utilities. Let Y_i be a random variable that indicates the firm's choice. McFadden (1973) shows that if the J disturbances are independent and identically distributed with Weibull distribution, then

$$\Pr(Y_i = j) = \frac{\exp(\alpha' \boldsymbol{w}_i + \beta' \boldsymbol{x}_{ij})}{\sum_{j=1}^{J} \exp(\alpha' \boldsymbol{w}_i + \beta' \boldsymbol{x}_{ij})}. \tag{2}$$

We assume that each firm has 21 potential choices—each of the top-20 underwriters and a single choice of any of the underwriters that are not ranked in the top 20. Since the attributes of the potential underwriters can influence an issuer's choice, we track underwriting relationships, lending relationships, analyst coverage, and all-star analyst coverage for each of the issuer's potential choices.[22] By including this information, we more accurately control for relationship-specific and underwriter-specific factors that could affect the probability of a firm selecting an underwriter. In addition, we modify our definition of concurrent loans to include loans from potential underwriters that are originated between 6 months prior to the SEO and 6 months after the SEO. This adjustment amounts to adding the 340 "other issuance period loans" to the sample of 358 concurrent loans.[23] Technically, this modification is needed because, otherwise, concurrent lending perfectly predicts an issuer's choice of underwriter. This methodology allows us to address whether, conditional on a firm issuing seasoned equity, lending at the time of the SEO improves the probability of obtaining the underwriting business.

In our models, we assume that the relevant issuer-specific characteristics ($\boldsymbol{w_i}$) are the logarithm of the SEO principal amount, the age of the firm, the long-term debt to equity ratio of the firm in the quarter of the SEO, and the industry of the issuer. These variables are chosen to control for the differences between concurrent and nonconcurrent issuers that are shown in Table II, Panel A. For the choice-specific attributes ($\boldsymbol{x}_{ij}$), we include variables to capture concurrent lending, prior lending relationships, prior underwriting relationships, as well as the reputation of the underwriter, the level of equity analyst coverage, and the

[22] For example, even though AMC Entertainment selected Goldman Sachs to underwrite its August 1998 SEO, we capture the fact that it could have selected Morgan Stanley and that Morgan Stanley provided all-star analyst coverage for the firm. Our final data set consists of 48,321 firm–underwriter pairs (2,301 firms $\times$ 21 choices).

[23] Since multiple underwriters can be lenders on a given lending facility, the number of underwriters that provide "concurrent loans" exceeds the total number of "concurrent loans." A total of 1,154 firm–underwriter pairs have at least one loan that is originated between 6 months prior to the SEO and 6 months after the SEO, of which 201 underwriters are selected to underwrite deals. Of the 1,154 pairs, an unranked underwriter provided a loan around the equity issuance on 106 occasions.

quality of equity analyst coverage.[24] Our priors are that preexisting lending and underwriting relationships between a firm and an underwriter will increase the probability of selection. Also, we expect that the reputation of the underwriter and the level and quality of equity analyst coverage will be positively related to underwriter selection. We estimate two models—in the first model, we do not consider differences between investment banks and commercial banks; we relax this restriction in the second model.

C.2. Results

In Table V, we present the results of the underwriter selection models. In both models, the control variables have the expected signs and most are highly significant. The coefficients of all concurrent lending variables are positive and statistically significant at the 1% level. This indicates that after controlling for other factors that significantly influence underwriter selection, providing a concurrent loan increases the probability of winning the underwriting mandate, conditional on a firm issuing seasoned equity. The effect is present for both commercial and investment bank underwriters. Further, the estimation in the first column of Table V shows that having a prior lending relationship with the underwriter (both with and without a concurrent loan) increases the likelihood of selection. Overall, the results demonstrate that providing a concurrent loan, and having a prior lending relationship in general, increases a bank's expected investment banking revenues and raises the likelihood of building relationships with issuers.

D. Probability of Keeping Future Business

Lending and underwriting concurrently may also foster a durable relationship that can boost expected future revenues by increasing the likelihood that the issuer will use the bank repeatedly. Future interactions could become more likely because this practice allows the bank to generate private information that can be used in ongoing transactions with the bank, thereby providing the bank with a source for both lending and underwriting relationships.[25] In this section, we determine whether concurrent lending and underwriting enhances an underwriter's ability to cultivate relationships by examining whether those firms that participate in a concurrent deal go back to the market more frequently and switch underwriters less often than issuers who do not receive a concurrent loan.

In Table VI, we present a univariate analysis of switching probabilities. For our sample of 2,301 issuers, 37% of concurrent issuers proceed with a

[24] All underwriters that have a ranking below twentieth are modeled as a single, unranked choice. We treat this potential choice as an investment bank. If any of the variables in $\boldsymbol{x}_{ij}$ equal 1 for any of the underwriters that are ranked below twentieth, then the variable equals 1 for the unranked choice. Results are robust to excluding the unranked choice.

[25] Access to firm-specific information is well known to be a key factor in developing and maintaining lending relationships (see Ongena and Smith (2000) for a survey of the literature). Private information is also a key determinant of investment banking relationships (see, e.g., Crane and Eccles (1993)).

Table V

Multivariate Model of Underwriter Selection (McFadden's Choice Model)

This table presents the results of two models of underwriter selection. For each issue, the issuer chooses from a set of 21 lead underwriters that contains the top-20 ranked equity underwriters from the year prior to the issue and a single underwriter that represents all other underwriters. The dependent variable is 1 if the potential underwriter is selected and 0, otherwise. There are issuer-specific and choice-specific independent variables. The issuer-specific variables are as follows: LNSIZE is the logarithm of the principal amount, expressed in millions of dollars; AGE is the firm's age, measured in years; DE-LTDEBT is the long-term debt to common equity ratio in the quarter of the SEO; and, SICx are industry dummy variables, which are 1 if the firm has the corresponding one-digit SIC. The choice-specific variables are: CONCLOAN is a dummy variable that equals 1 if a potential underwriter provides a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO *and* the potential underwriter had never provided a loan to the issuer in the past; CONCPLEND is a dummy variable that equals 1 if a potential underwriter provides a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO *and* the potential underwriter provided a loan to the issuer prior to 6 months before the SEO; PRIORLEND is a dummy variable that equals 1 if a loan between the potential underwriter and the issuer was originated at any time prior to 6 months before the SEO *and* the potential underwriter does not provide a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO; PRIORUND is 1 if a potential underwriter had been the underwriter on any prior equity offering by the issuer; IB (CB) is 1 if the potential underwriter of the SEO is an investment bank (commercial bank); COVERAGE is 1 if the potential underwriter had provided an earnings per share estimate for the firm during the year prior to the SEO; ALLSTAR is 1 if COVERAGE is 1 and the analyst was ranked as an all-star by Institutional Investor magazine for the year prior to the SEO; and, RANK1 through RANK20 are 20 dummy variables, one for each ranked potential choice. All variables are explained in detail in Appendix A. In column (1), we do not consider differences between investment banks and commercial banks. In column (2), we allow for these differences by interacting both IB and CB with CONCLOAN, CONCPLEND, PRIORLEND, and PRIORUND. The choice-specific variables are interacted with the 20 rank dummy variables in order to be included in models. Estimated coefficients on the rank dummy variables and the issuer-specific variables are not reported. ***, **, * indicates significantly different than 0 at the 1%, 5%, and 10% level, respectively.

	(1)		(2)	
	Coefficient	*T*-ratio	Coefficient	*T*-ratio
CONCLOAN	1.997	10.35***		
CONCPLEND	1.574	7.23***		
PRIORLEND	0.534	3.38***		
PRIORUND	2.728	36.79***		
IB × CONCLOAN			2.086	8.32***
CB × CONCLOAN			1.838	6.83***
IB × CONCPLEND			1.920	5.79***
CB × CONCPLEND			1.439	5.54***
IB × PRIORLEND			0.883	4.37***
CB × PRIORLEND			0.141	0.58
IB × PRIORUND			2.898	33.02***
CB × PRIORUND			2.244	15.31***
IB			−0.107	−1.14
COVERAGE	1.618	19.57***	1.655	19.89***
ALLSTAR	0.582	4.83***	0.559	4.62***
Psuedo R^2	0.4341		0.4362	
Log likelihood	5,053.52		5,078.83	

Table VI
Univariate Analysis of Keeping the Same Underwriter in a Subsequent SEO

This table summarizes the probability that an issuer will proceed with a subsequent seasoned equity offering (SEO) and, if so, the probability that the issuer will keep the underwriter, based on whether the initial SEO was a concurrent deal. A concurrent deal is any SEO in which the underwriter provided a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO. The underwriter is an IB (CB) if the parent or holding company of the underwriter is an investment bank (commercial bank) at the time of the SEO. Panel A provides a full sample analysis. Panel B examines those SEOs in which the underwriter is an investment bank. Panel C examines those SEOs in which the underwriter is a commercial bank. *p*-Values for the difference in proportions are provided in the last column. ***, **, and * indicate significantly different than 0 at the 1%, 5%, and 10% level, respectively.

	Concurrent Deals	Nonconcurrent Deals	Proportion Test *p*-Value
Panel A: Full Sample			
# in sample	201	2,100	
# that repeat	74	462	
% of sample that repeat	36.82%	22.00%	0.0000***
# keep same underwriter	42	207	
% of repeaters that keep same underwriter	56.76%	44.81%	0.0556*
Panel B: Underwriter Is an IB			
# in sample	110	1,509	
# that repeat	43	347	
% of sample that repeat	39.09%	23.00%	0.0001***
# keep same underwriter	28	148	
% of repeaters that keep same underwriter	65.12%	42.65%	0.0049***
Panel C: Underwriter Is a CB			
# in sample	91	591	
# that repeat	31	115	
% of sample that repeat	34.07%	19.46%	0.0018***
# keep same underwriter	14	59	
% of repeaters that keep same underwriter	45.16%	51.30%	0.5162

subsequent equity offering, while only 22% of nonconcurrent issuers go back to the equity market.[26] Of those firms that have a follow-up equity offering, 57% of concurrent issuers and 45% of nonconcurrent issuers keep the same underwriter, a significant difference at the 10% level. However, there is a disparity between investment bank and commercial bank underwriters. While a prior concurrent deal significantly increases the probability of retaining future business for investment banks, the effect is not present for commercial banks. This result indicates that commercial banks may not be able to leverage their

[26] We examine subsequent SEOs that took place before March 31, 2002. Extending the sample end date allows issuers from the latter part of the sample to potentially reissue.

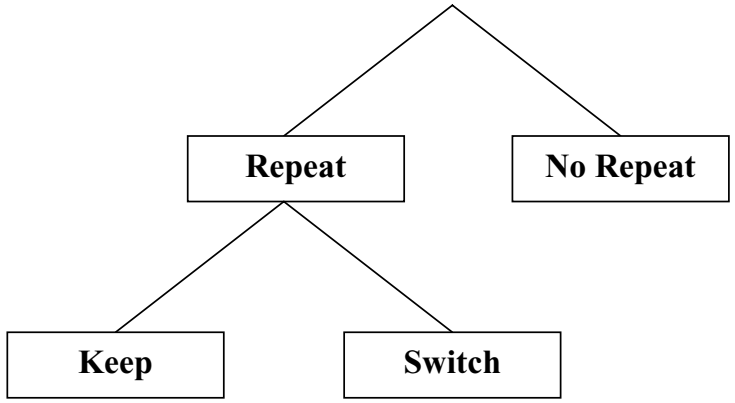

Figure 1. Nesting structure. This figure presents the nesting structure for the nested logit model of keeping the same underwriter in a subsequent SEO. Each issuer has a first-level choice of reissuing ("REPEAT") or not reissuing ("NO REPEAT"). If the issuer decides to reissue, the issuer has a second-level choice of keeping the underwriter of the current SEO ("KEEP") or switching to a new underwriter ("SWITCH") in the subsequent offering.

practice of concurrently lending and underwriting into extended underwriting relationships.

D.1. Nested Logit Model

To determine whether these results withstand a multivariate specification, we use a nested logit model. As shown in Figure 1, we assume that each issuer makes a two-stage decision. First, the issuer decides if it will proceed with a subsequent SEO or if it will not issue again. Second, if the issuer chooses to issue again, then it can keep the same underwriter or switch to a new underwriter.

Following Maddala (1983), let k index the first-level alternative and l the second-level alternative.[27] Also, let $\boldsymbol{Y}_{kl}$ and $\boldsymbol{Z}_k$ be vectors of explanatory variables specific to the categories (k, l) and (k), respectively. Then each issuer will have a utility U_{kl} for alternative (k, l) that is a function of the explanatory variables. We set $U_{kl} = \alpha' \boldsymbol{Y}_{kl} + \beta' \boldsymbol{Z}_k + \varepsilon_{kl}$, and then the probability of choosing l, conditional on first choosing k, is

$$\Pr_{l|k} = \frac{\exp(\boldsymbol{\alpha}' \boldsymbol{Y}_{kl})}{\sum_{l=1}^{L} \exp(\boldsymbol{\alpha}' Y_{kl})}. \tag{3}$$

Define the inclusive values for category (k) as

$$\mathrm{IV}_{\boldsymbol{k}} = \ln\left(\sum_{l=1}^{L} \exp(\boldsymbol{\alpha}' \mathbf{Y}_{kl})\right), \tag{4}$$

which leaves us with the probability of choosing k as

[27] For our model, k can be "Repeat" or "No Repeat" while l can be "Keep" or "Switch."

$$\Pr_k = \frac{\exp(\beta' \mathbf{Z}_k + \tau_k \mathrm{IV}_k)}{\sum_{k=1}^{K} \exp(\beta' \mathbf{Z}_k + \tau_k \mathrm{IV}_k)}. \tag{5}$$

In our models, we assume that the variables that only affect the decision to reissue ($\mathbf{Z}_k$) are the logarithm of the SEO principal amount, the age of the firm, the long-term debt to equity ratio of the firm in the quarter of the SEO, and the industry of the issuer. For the variables that affect both the decision to reissue and the decision to keep or switch underwriters ($\mathbf{Y}_{kl}$), we include variables to capture concurrent lending, prior lending relationships, prior underwriting relationships, as well as differences between the original underwriter and the subsequent underwriter in the level and quality of equity analyst coverage and underwriter ranking. We expect that prior lending and underwriting relationships will be positively related to retaining future business. Also, previous papers indicate that firms will be more likely to switch to an underwriter who has higher quality equity analyst coverage and is ranked above the original underwriter (see, e.g., Krigman et al. (2001), Fernando et al. (2005)). As in the previous section, we estimate one model in which we do not consider differences between investment banks and commercial banks and a second model in which we relax this restriction. Based on the univariate results, we expect a previous concurrent deal with an investment bank underwriter to increase the probability that the investment bank retains future underwriting business. We also expect that a previous concurrent deal with a commercial bank will not significantly affect the probability that the bank can retain equity underwriting business in the future.

D.2. Results

In Table VII, we present the results of the nested logit models. The base case category is that the issuer does not have a subsequent equity offering, so variables that are interacted with KEEP provide the effects of choosing to reissue and keep the same underwriter instead of not reissuing at all. We also determine the effect of the variables on keeping the same underwriter instead of switching to a new underwriter through *t*-tests for differences between keeping and switching.

In the first column of Table VII, we present the results of the model in which we do not consider differences between investment banks and commercial banks. We find that a prior concurrent deal increases the probability of an issuer choosing to reissue and keep the same lead underwriter relative to not reissuing. The *t*-tests for differences between keeping and switching indicate that a previous concurrent deal also increases the probability of keeping an underwriter instead of switching to a new underwriter, although this result is insignificant. Furthermore, we find that prior lending relationships (both with and without a concurrent loan) increase the probability of an issuer choosing to keep the same lead underwriter. These results highlight the importance of lending in generating future investment banking business.

The second column of Table VII shows the results for the case in which we allow the coefficients to reflect disparities between investment banks and commercial banks. We find that a prior concurrent deal (without the existence of a prior lending relationship) with an investment bank significantly increases the

Table VII

Multivariate Model of Keeping the Same Underwriter in a Subsequent SEO

In this table, we present results of two nested logit models of the probability of keeping or switching underwriters in a subsequent seasoned equity offering (SEO). Let the alternatives of "Repeat" and "Not Repeat" belong to the upper nest and the alternatives of "Keep" and "Switch" belong to the lower nest. The dependent variable indicates whether the issuer decides to either (i) "Not Repeat," (ii) "Repeat" and "Keep", or (iii) "Repeat" and "Switch." The following independent variables affect the decision in the upper nest only: LNSIZE is the logarithm of the original SEO principal amount, expressed in millions of dollars; AGE is the firm's age, measured in years; DE-LTDEBT is the long-term debt to common equity ratio in the quarter of the original SEO; and, SICx are industry dummy variables, which are one if the firm has the corresponding one-digit SIC. The following independent variables affect both the upper nest and lower nest decisions: CONCLOAN is a dummy variable that equals 1 if the underwriter provides a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO *and* the underwriter had never provided a loan to the issuer in the past; CONCPLEND is a dummy variable that equals 1 if the underwriter provides a loan to the issuer between 6 months prior to the original SEO and 6 months after the original SEO *and* the underwriter provided a loan to the issuer prior to 6 months before the SEO; PRIORLEND is a dummy variable that equals 1 if a loan between the underwriter and the issuer was originated at any time prior to 6 months before the SEO *and* the underwriter does not provide a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO; PRIORUND is 1 if the underwriter had been the underwriter on any equity offering by the issuer prior to the original SEO; IB (CB) is 1 if the underwriter of the original SEO is an investment bank (commercial bank); CNGCOV is the difference between the coverage provided by the subsequent underwriter and the original underwriter; CNGSTAR is the difference between the all-star coverage provided by the subsequent underwriter and the original underwriter; CNGRANK is the difference between the subsequent underwriter's ranking and the original underwriter's ranking; and, KEEP and SWITCH are choice-specific dummy variables. All variables are explained in detail in Appendix A. In column (1), we do not consider differences between investment banks and commercial banks. In column (2), we allow for these differences by interacting both IB and CB with CONCLOAN, CONCPLEND, PRIORLEND, and PRIORUND. CONCLOAN, PRIORUND, PRIORLEND, and IB are interacted with KEEP and SWITCH in order to be included in the models. LNSIZE, AGE, DE-LTDEBT, and SICx are interacted with REPEAT in order to be included in the models. Estimated coefficients for the industry variables (SICx) are not reported. ***, **, * indicates significantly different than zero at the 1%, 5%, and 10% level, respectively.

	(1)		(2)	
	Coefficient	*T*-ratio	Coefficient	*T*-ratio
Variables That Affect the Choice of "REPEAT" or "NO REPEAT"				
REPEAT × LNSIZE	0.124	2.29**	0.139	2.55**
REPEAT × AGE	0.003	1.20	0.002	0.74
REPEAT × DE-LTDEBT	0.010	1.05	0.010	1.08
Variables That Affect the Choice of "NO REPEAT," "(REPEAT, KEEP)," or "(REPEAT, SWITCH)"				
Concurrent lending/no prior lending relationship				
KEEP × CONCLOAN	0.434	2.52**		
KEEP × IB × CONCLOAN			0.727	3.70***
KEEP × CB × CONCLOAN			−0.188	−0.44
SWITCH × CONCLOAN	0.095	0.45		
SWITCH × IB × CONCLOAN			−0.083	−0.27
SWITCH × CB × CONCLOAN			0.478	1.74*
Concurrent lending with prior lending relationship				
KEEP × CONCPLEND	0.380	1.87*		
KEEP × IB × CONCPLEND			0.071	0.19
KEEP × CB × CONCPLEND			0.603	2.23**
SWITCH × CONCPLEND	−0.008	−0.03		
SWITCH × IB × CONCPLEND			0.014	0.04
SWITCH × CB × CONCPLEND			0.125	0.36

(*continued*)

Table VII—*Continued*

	(1)		(2)	
	Coefficient	*T*-ratio	Coefficient	*T*-ratio
Prior lending relationship / no concurrent lending				
KEEP × PRIORLEND	0.320	1.71*		
KEEP × IB × PRIORLEND			0.161	0.64
KEEP × CB × PRIORLEND			0.632	2.18**
SWITCH × PRIORLEND	0.018	0.08		
SWITCH × IB × PRIORLEND			0.053	0.19
SWITCH × CB × PRIORLEND			0.025	0.05
Prior underwriting relationship				
KEEP × PRIORUND	0.282	2.77***		
KEEP × IB × PRIORUND			0.159	1.31
KEEP × CB × PRIORUND			0.557	2.91***
SWITCH × PRIORUND	−0.112	−1.08		
SWITCH × IB × PRIORUND			−0.188	−1.53
SWITCH × CB × PRIORUND			0.072	0.35
Coverage and reputation				
SWITCH × CNGCOV	0.120	0.62	0.097	0.49
SWITCH × CNGSTAR	0.737	2.36**	0.704	2.26**
SWITCH × CNGRANK	0.146	7.72***	0.146	7.55***
Bank classification and constants				
KEEP × IB			0.250	1.38
SWITCH × IB			0.312	1.85*
KEEP	−1.494	−8.41***	−1.730	−7.14***
SWITCH	−1.303	−8.32***	−1.582	−6.78***
IV(REPEAT)	2.490	6.83***	2.441	6.68***
LR test of homoskedasticity (IV(Repeat) = 1)	34.97***		32.30***	
Log likelihood	1,315.01		1,301.27	
t-Tests for Differences between Keeping and Switching				
KEEP × CONCLOAN–SWITCH × CONCLOAN	0.339	1.05		
KEEP × IB × CONCLOAN–SWITCH × IB × CONCLOAN			0.810	1.92*
KEEP × CB × CONCLOAN–SWITCH × CB × CONCLOAN			−0.667	−1.10
KEEP × CONCPLEND–SWITCH × CONCPLEND	0.388	1.00		
KEEP × IB × CONCPLEND–SWITCH × IB × CONCPLEND			0.057	0.09
KEEP × CB × CONCPLEND–SWITCH × CB × CONCPLEND			0.478	0.93
KEEP × PRIORLEND–SWITCH × PRIORLEND	0.303	0.82		
KEEP × IB × PRIORLEND–SWITCH × IB × PRIORLEND			0.108	0.23
KEEP × CB × PRIORLEND–SWITCH × CB × PRIORLEND			0.608	0.97
KEEP × PRIORUND–SWITCH × PRIORUND	0.394	2.21**		
KEEP × IB × PRIORUND–SWITCH × IB × PRIORUND			0.347	1.62
KEEP × CB × PRIORUND–SWITCH × CB × PRIORUND			0.485	1.44

probability of keeping the same underwriter in the subsequent equity offering. The results indicate that for commercial bank underwriters, a concurrent deal does not significantly affect the probability that an underwriter will keep the same underwriter instead of switching to a new underwriter in the subsequent equity offering. These results are consistent with the univariate statistics in Table VI.

Combined with our previous findings, we find that investment banks discount underwriter spreads and that concurrent deals increase the probability of retaining future underwriting business from the firm. Commercial banks, on the other hand, discount loan yield spreads that can help establish lending relationships that are well known to lead to other fee-based lending business

(for some recent evidence, see Bharath et al. (2004)). Therefore, the results are consistent with each type of underwriter competing more aggressively in its area of expertise and in the area in which it is more likely to generate future business.

III. Conclusion

We use a unique data set drawn from multiple data sources and augmented by hand-collected data to examine when financial institutions concurrently lend and underwrite, and to analyze the effect on firms' financing costs and firm–underwriter relationships. We find evidence that is consistent with concurrent lending and underwriting occurring when there are large potential efficiency gains that arise due to informational economies of scope from combining lending and equity underwriting. This is supported by the preponderance of concurrent deals involving highly leveraged and noninvestment-grade issuers and the substantial benefits that concurrent deals bring to such issuers. For issuers, these benefits come in the form of lower financing costs, as concurrent issuers receive a lower underwriter fee for the equity offering and a discounted yield spread on the concurrent loan. The cost reductions are large and significant for issuers who are noninvestment-grade rated, where the expected informational economies of scope are sizeable. Interestingly, the benefit that an issuer receives varies by the type of underwriter involved in the transaction. Investment banks offer reduced underwriter spreads on concurrent SEOs, while commercial banks offer discounted loan yield spreads. This is consistent with each type of underwriter competing more aggressively in its area of expertise. In addition to benefiting issuers, concurrent lending and underwriting produces gains for underwriters. We find that providing a concurrent loan increases the likelihood of receiving the current equity underwriting business, and also helps generate other business from the issuers, with investment bank underwriters more likely to receive future equity underwriting mandates from concurrent issuers. These results are consistent with concurrent loans being used to help build ongoing, durable relationships that increase an underwriter's expected revenues. This study also highlights the importance of prior lending relationships, in general. Issuers with prior lending relationships receive significantly lower underwriter spreads and, for the underwriter, a prior lending relationship increases the likelihood of receiving underwriting business. Our findings of substantial benefits to issuers and underwriters from combining lending with underwriting indicates that concurrent lending is likely to continue into the future and that lending will influence the pricing of financial products and services as well as remain an important factor in determining firm–underwriter pairings.

Appendix A
Detailed Descriptions of the Variables

Underwriter Spread Regressions (Section II.A.)

USPREAD: The underwriter spread, which is the compensation paid to the underwriter for selling the firm's security issue, expressed as a percent of the capital raised.

CONCLOAN: A dummy variable that equals 1 if the underwriter provided a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO *and* the underwriter had never provided a loan to the issuer in the past.

CONCPLEND: A dummy variable that equals 1 if the underwriter provided a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO *and* the underwriter provided a loan to the issuer prior to 6 months before the SEO.

PRIORLEND: A dummy variable that equals 1 if a loan between the underwriter and the issuer was originated at any time prior to 6 months before the SEO *and* the underwriter does not provide a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO.

PRIORUND: A dummy variable that equals 1 if the underwriter had been the underwriter on any prior equity offering by the issuer.

IB: A dummy variable that equals 1 if the parent/holding company of the underwriter at the time of the issue is an investment bank.

CB: A dummy variable that equals 1 if the parent/holding company of the underwriter at the time of the issue is a commercial bank.

(1/SEOSIZE): The inverse of the principal amount of the offering (in millions of dollars). This variable captures the fixed cost component of underwriter spreads.

(SEOSIZE / MKTCAP): The principal amount of the offering divided by the market capitalization of the issuer at the date of the SEO. This variable captures the variable cost component of underwriting spreads.

VOL: The daily standard deviation of the issuer's common stock rate of return over the 220 trading days ending 40 days before the offering.

MKTACT: The dollar volume of issuance by firms whose SIC codes are not six in the U.S. seasoned equity market during the 3 months prior to the SEO date.

Propensity Score / The Pricing of Concurrent Loans (Section II.B.)

YSPREAD: The yield spread of the loan, measured as the rate the borrower pays to the lender, quoted in basis points over the London Interbank offer rate (LIBOR). We use the *DealScan* item "all-in spread drawn," which adds the spread of the loan to any fees that have to be paid back to the bank.

CONCURRENT: A dummy variable that equals 1 if the lending facility is to an issuer of an SEO and is originated between 6 months prior to and 6 months after the SEO and the lender is selected to underwrite the SEO.

ISSPERLOAN: A dummy variable that equals 1 if the lending facility is to an issuer of an SEO and is originated between 6 months prior to and 6 months after the SEO, where the lender could have been selected to underwrite the SEO but is not provided with underwriting responsibilities.

RATING: A variable that provides the Standard & Poor's credit rating of the firm at the date of the lending facility. Each rating is given a numerical counterpart: AAA = 1, AA = 2, A = 3, BBB = 4, BB = 5, B = 6, CCC = 7, CC = 8, and C = 9.

FACSIZE: The notional value of the loan facility between the lender and the borrower, expressed in millions of dollars.

LENGTH: The term length of the loan, measured as the difference between the term facility active date and the term facility expiration date, measured in months.

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

YEAR: Dummy variables that correspond to the year of the origination date of the lending facility.

INDUSTRY: Dummy variables that equal 1 if the borrower is in the corresponding two-digit SIC group.

(*continued*)

Appendix A—*Continued*

McFadden Choice Model / Underwriter Relationships (Section II.C.)

CONCLOAN: A dummy variable that equals 1 if a potential underwriter provided a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO *and* the potential underwriter had never provided a loan to the issuer in the past.

CONCPLEND: A dummy variable that equals 1 if the potential underwriter provided a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO *and* the potential underwriter provided a loan to the issuer prior to 6 months before the SEO.

PRIORLEND: A dummy variable that equals 1 if a loan between the potential underwriter and the issuer was originated at any time prior to 6 months before the SEO *and* the potential underwriter does not provide a loan to the issuer between 6 months prior to the SEO and 6 months after the SEO.

PRIORUND: A dummy variable that equals 1 if the potential underwriter had been the underwriter on any prior equity offering by the issuer.

COVERAGE: A dummy variable that equals 1 if the potential underwriter provided an earnings per share estimate for the firm during the year prior to the SEO.

ALLSTAR: A dummy variable that equals 1 if COVERAGE is one and the analyst was ranked as an all-star by *Institutional Investor* magazine for the year prior to the SEO.

RANK: We compute each underwriter's yearly SEO market share by adding the principal amounts of all SEOs in which the bank was an underwriter and dividing this total by the principal amounts of all SEOs during the year. To avoid potential simultaneity problems, we rank the underwriters on a yearly basis, based on the market share in the previous year. If a merger between underwriters occurred during the year, we use the combined market share of the underwriters. The top-ranked underwriter is given a score of 20, the second ranked underwriter is 19, and so on. Underwriters not ranked in the top 20 are given a score of 0.

Nested Logit Model / Keeping Future Business (Section II.D.)

CONCLOAN: A dummy variable that equals 1 if the underwriter provided a loan to the issuer between 6 months prior to the original SEO and 6 months after the original SEO *and* the underwriter had never provided a loan to the issuer in the past.

CONCPLEND: A dummy variable that equals 1 if the underwriter provided a loan to the issuer between 6 months prior to the original SEO and 6 months after the original SEO *and* the underwriter provided a loan to the issuer prior to 6 months before the original SEO.

PRIORLEND: A dummy variable that equals 1 if a loan between the underwriter and the issuer was originated at any time prior to 6 months before the original SEO *and* the underwriter does not provide a loan to the issuer between 6 months prior to the original SEO and 6 months after the original SEO.

PRIORUND: A dummy variable that equals 1, if the underwriter had been the underwriter on any equity offering prior to the original SEO by the issuer.

REPEAT: A dummy variable that equals 1 if the issuer has a subsequent offering.

KEEP: A dummy variable that equals 1 if the issuer keeps the same underwriter in the subsequent offering.

SWITCH: A dummy variable that equals 1 if the issuer switches underwriters in the subsequent offering.

CNGCOV: For "switchers," the difference between the coverage provided by the new underwriter and the original underwriter during the year prior to the subsequent SEO. The variable can take on the values of -1, 0, or 1. By definition, for all nonrepeaters and keepers, it has a value of 0.

CNGSTAR: For "switchers," the difference between the all-star coverage provided by the new underwriter and the original underwriter during the year prior to the subsequent SEO. The variable can take on the values of -1, 0, or 1. By definition, for all nonrepeaters and keepers, it has a value of 0.

(*continued*)

Appendix A—*Continued*

CNGRANK: For "switchers," the difference between the subsequent underwriter's ranking in the year before the subsequent issue date and the original underwriter's ranking in the year before the subsequent issue date. For keepers and nonrepeaters, the variable is 0.
IB: A dummy variable that equals 1 if the parent/holding company of the potential underwriter at the time of the issue is an investment bank.
CB: A dummy variable that equals 1 if the parent/holding company of the potential underwriter at the time of the issue is a commercial bank.

Control Variables

LNSIZE: The logarithm of the principal amount of the offering.
DE-LTDEBT: The long-term debt to equity ratio in the quarter of the SEO.
AGE: The firm's age, measured as the difference between the SEO date and the incorporation date, expressed in years.
SICx: Dummy variables that equal 1 if the issuer is in the corresponding one-digit SIC group.
IGRADE: A dummy variable that equals 1 if the issuer is rated AAA, AA, A, or BBB in the quarter of the SEO by Standard & Poor's.
JUNK: A dummy variable that equals 1, if the issuer is rated BB, B, CCC, CC, or C in the quarter of the SEO by Standard & Poor's.

Appendix B: Econometric Matching Methodology

Econometric matching techniques were developed by Rosenbaum and Rubin (1983) and extended by Heckman and Robb (1986) and Heckman et al. (1997, 1998). Below, we provide a summary of their results and how we apply these methods to our data.

Let $D = 1$ if the loan is a concurrent loan, and let $D = 0$ if the loan is a nonconcurrent loan. In principle, the i^{th} concurrent loan has its observed "concurrent" yield spread Y_{1i} and another yield spread Y_{0i} that would result if it were a nonconcurrent loan. To determine the average effect of concurrent lending on yield spreads, one would calculate the mean difference between Y_{1i} and Y_{0i} for all concurrent loans. However, since we do not observe Y_{0i} for our sample of concurrent loans, we have a missing data problem that cannot be solved at the level of the individual, so we reformulate the problem at the population level. We focus on $E(Y_1 - Y_0 \mid D = 1, X)$, the mean effect of the difference between concurrent loans and nonconcurrent loans with characteristics X. While the mean $E(Y_1 \mid D = 1, X)$ can be identified from data on concurrent loans, some assumptions must be made to identify the unobservable counterfactual mean, $E(Y_0 \mid D = 1, X)$. The observable outcome of nonconcurrent loans $E(Y_0 \mid D = 0, X)$ can be used to approximate $E(Y_0 \mid D = 1, X)$. The selection bias that arises from this approximation is $B(X) = E(Y_0 \mid D = 1, X) - E(Y_0 \mid D = 0, X)$.

We use a method of matching that solves the evaluation problem. Following Heckman and Robb (1986), we assume that all relevant differences between concurrent loans and nonconcurrent loans are captured by their observable characteristics X. Let $(Y_0, Y_1) \perp D \mid X$ denote the statistical independence of $(Y_0,$

Y_1) and D conditional on X. Rosenbaum and Rubin (1983) establish that when $(Y_0, Y_1) \perp D \mid X$ and $0 < P(D = 1 \mid X) < 1$ (which are referred to as the strong ignorability conditions), then $(Y_0, Y_1) \perp D \mid P(D = 1 \mid X)$. While it is often difficult to match on high dimension X, this result allows us to match based on the one-dimensional $P(D = 1 \mid X)$ alone. The propensity score, $P(D = 1 \mid X)$, can be estimated using probit or logit models. Heckman et al. (1998) extend this result by showing that the strong ignorability conditions are overly restrictive for the estimation of $E(Y_1 - Y_0 \mid D = 1, X)$. Instead, a weaker mean independence condition $E(Y_0 \mid D = 1, P(D = 1 \mid X)) = E(Y_0 \mid D = 0, P(D = 1 \mid X))$ is all that is required.

To implement econometric matching, we compute propensity scores for each of the concurrent loans and nonconcurrent loans. There may be loans that have propensity scores that are outside of the common support of concurrent loan and nonconcurrent loan propensity scores. Using loans that fall outside of the common support can substantially bias the results (see, e.g., Heckman et al. (1997)). As a result, we remove all loans that are outside of the common propensity score support.

We use two classes of propensity score matching estimators: (i) nearest neighbor matching and (ii) kernel-based matching.[28] Let Y_{1i} be the yield spread of a concurrent loan, Y_{0j} be the yield spread of a nonconcurrent loan, and let $\bar{Y}^z_{0i}$ represent the weighted average of yield spreads of the nonconcurrent loans using estimator z that is matched with Y_{1i}. We compute the sample average of yield spread differences, $Y_{1i} - \bar{Y}^z_{0i}$.

For each concurrent loan, the nearest neighbor matching estimator chooses the n nonconcurrent loans with closest propensity scores to the concurrent loan propensity score. The estimator computes the arithmetic average of the yield spreads of these n nonconcurrent loans. For each Y_{1i}, we match

$$\bar{Y}^{NN}_{0i} = \frac{1}{n} \sum_{j \in N(i)} Y_{0j}, \tag{A1}$$

where $N(i)$ is the set of nonconcurrent loans that are nearest neighbors. We set $n = 10$ and $n = 50$.

The kernel estimators construct matches for each concurrent loan by using weighted averages of yield spreads of multiple nonconcurrent loans. If weights from a typical symmetric, nonnegative, unimodal kernel $K(\bullet)$ are used, then the kernel places higher weight on loans close in terms of $P(D = 1 \mid X)$ and lower or zero weight on more distant observations. Let

$$K_{ij} = K\left(\frac{P(X_{1i}) - P(X_{0j})}{h}\right), \tag{A2}$$

where h is a fixed bandwidth and $P(X) = P(D = 1 \mid X)$. For each Y_{1i}, we match a corresponding $\bar{Y}^K_{0i}$, where

[28] The propensity score matching methods are discussed in greater detail in Heckman et al. (1997, 1998).

$$\bar{Y}_{0i}^{K} = \frac{\sum_{j} K_{ij} Y_{0j}}{\sum_{j} K_{ij}}. \tag{A3}$$

We use two different kernels to compute $\bar{Y}_{0i}^{K}$. The Gaussian kernel uses all nonconcurrent loans, while the Epanechnikov kernel only uses nonconcurrent loans with a propensity score $P(X_{0j})$ that falls within the fixed bandwidth h of $P(X_{1i})$. We set $h = 0.01$. As a robustness check, we also try different values of h and obtain similar results.

To determine whether econometric matching is a viable method of evaluation, Heckman et al. (1997, 1998) identify four features of the data and establish matching techniques that can substantially reduce bias: (i) participants and controls have the same distributions of unobserved attributes; (ii) participants have the same distributions of observed attributes; (iii) outcomes and characteristics are measured in the same way for both groups; and, (iv) participants and controls are from the same economic environment. Items (iii) and (iv) are met very well in this study because the loan yield spreads and other loan characteristics are measured in the same way for both concurrent and nonconcurrent loans, and the nonconcurrent loans are from the same time period as the concurrent loans. To satisfy condition (ii), we use loan characteristics to match concurrent loans to nonconcurrent loans. Feature (i) cannot be achieved in a nonexperimental evaluation. However, Heckman et al. (1997) note that feature (i) is only a small part of bias in their experimental study. Thus, the method of matching nonconcurrent loans to concurrent loans can produce a viable estimate of the difference between nonconcurrent loan and concurrent loan yield spreads.

REFERENCES

Altinkilic, Oya, and Robert Hansen, 2000, Are there economies of scale in underwriting fees? Evidence of rising external financing costs, *Review of Financial Studies* 13, 191–218.

Ang, James, and Terry Richardson, 1994, The underwriting experience of commercial bank affiliates prior to the Glass-Steagall Act: A re-examination of evidence for passage of the act, *Journal of Banking and Finance* 18, 351–395.

Baker, Wayne, 1990, Market networks and corporate behavior, *American Journal of Sociology* 96, 589–625.

Benston, George, 1990, *The Separation of Commercial and Investment Banking* (Oxford University Press, New York).

Benzoni, Luca, and Carola Schenone, 2004, Conflict of interest or certification? Evidence from IPOs underwritten by the firm's relationship bank, Working paper, University of Minnesota.

Berger, Allen, Rebecca Demsetz, and Philip Strahan, 1999, The consolidation of the financial services industry: Causes, consequences, and implications for the future, *Journal of Banking and Finance* 23, 135–194.

Best, Ronald, and Hang Zhang, 1993, Alternative information sources and the information content of bank loans, *Journal of Finance* 48, 1507–1522.

Bharath, Sreedhar, 2002, Agency costs, bank specialness and renegotiation, Working paper, New York University.

Bharath, Sreedhar, Sandeep Dahiya, Anthony Saunders, and Anand Srinivasan, 2004, So what do I get? The bank's view of lending relationships, Working paper, New York University.

Billett, Matthew, Mark Flannery, and Jon Garfinkel, 1995, The effect of lender identity on a borrowing firm's equity return, *Journal of Finance* 50, 699–718.

Blundell, Robert, Lorraine Dearden, Alissa Goodman, and Howard Reed, 2000, The returns to higher education in Britain: Evidence from a British cohort, *Economic Journal* 110, F82–F99.

Boot, Arnoud, and Anjan Thakor, 1997, Banking scope and financial innovation, *Review of Financial Studies* 10, 1099–1131.

Booth, James, and Richard Smith, 1986, Capital raising, underwriting and the certification hypothesis, *Journal of Financial Economics* 15, 261–281.

Carter, Richard, and Steven Manaster, 1990, Initial public offerings and underwriter reputation, *Journal of Finance* 45, 1045–1067.

Chaplinsky, Susan, and Gayle Erwin, 2001, Commercial banks as equity underwriters, Working paper, University of Virginia.

Clarke, Jonathan, Ajay Khorana, Ajay Patel, and P. Raghavendra Rau, 2003, Do all-star analysts drive investment banking deal flow? Working paper, Wake Forest University.

Conniffe, Denis, Vanessa Gash, and Philip J. O'Connell, 2000, Evaluating state programmes: "Natural experiments" and propensity scores, *The Economic and Social Review* 31, 283–308.

Corwin, Shane, and Paul Schultz, 2005, The role of IPO underwriting syndicates: Pricing, information production, and underwriter competition, *Journal of Finance* 60, 443–486.

Crane, Robert, and Dwight Eccles, 1993, Customer relationships in the 1990s, in Samuel Hayes, ed.: *Financial Services: Perspectives and Challenges* (Harvard Business School Press, Boston).

Dearden, Lorraine, Javier Ferri, and Costa Meghir, 2002, The effect of school quality on educational attainment and wages, *Review of Economics and Statistics* 84, 1–20.

Dingell, John, 2002, Letter to FRB and OCC re: "Pay to play" practices, Jul 11 http://www.house.gov/commerce_democrats/press/107/tr179.shtml.

Fernando, Chitru S., Vladimir A. Gatchev, and Paul A. Spindt, 2005, Wanna dance? How firms and underwriters choose each other, *Journal of Finance*.

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

Greene, William, 2000, *Econometric Analysis*, 4th ed. (Prentice-Hall, New Jersey).

Heckman, James, Hidehiko Ichimura, and Petra Todd, 1997, Matching as an econometric evaluation estimator: Evidence from evaluating a job training programme, *Review of Economic Studies* 64, 605–654.

Heckman, James, Hidehiko Ichimura, and Petra Todd, 1998, Matching as an econometric evaluation estimator, *Review of Economic Studies* 65, 261–294.

Heckman, James, and Richard Robb, 1986, Alternative method for solving the problem of selection bias in evaluating the impact of treatments on outcomes, in Howard Wainer, ed.: *Drawing Inferences from Self-Selected Samples* (Springer-Verlag, New York).

Hubbard, R. Glenn, Kenneth Kuttner, and Darius Palia, 2002, Are there bank effects in borrowers' costs of funds? Evidence from a matched sample of borrowers and banks, *Journal of Business* 75, 559–582.

James, Christopher, 1987, Some evidence on the uniqueness of bank loans, *Journal of Financial Economics* 19, 217–235.

James, Christopher, 1992, Relationship-specific assets and the pricing of underwriter services, *Journal of Finance* 47, 1865–1885.

James, Christopher, and David C. Smith, 2000, Are banks still special? New evidence on their role in the corporate capital-raising process, *Journal of Applied Corporate Finance* 13, 395–422.

Kanatas, George, and Jianping Qi, 1998, Underwriting by commercial banks: Incentive conflicts, scope economies, and project quality, *Journal of Money, Credit, and Banking* 30, 119–133.

Kanatas, George, and Jianping Qi, 2003, Integration of lending and underwriting: Implications of scope economies, *Journal of Finance* 58, 1167–1191.

Krigman, Laurie, Wayne Shaw, and Kent Womack, 2001, Why do firms switch underwriters?, *Journal of Financial Economics* 60, 245–284.

Kroszner, Randall, and Raghuram Rajan, 1994, Is the Glass-Steagall Act justified? A study of the U.S. experience with universal banking before 1933, *American Economic Review* 84, 810–832.

Ljungqvist, Alexander, Felicia Marston, and William J. Wilhelm, 2004, Competing for securities underwriting mandates: Banking relationships and analyst recommendations, *Journal of Finance* (forthcoming).

Lummer, Scott, and John McConnell, 1989, Further evidence on bank lending process and capital market response to bank loan agreements, *Journal of Financial Economics* 25, 52–63.

Maddala, G. S., 1983, *Limited Dependent and Qualitative Variables in Econometrics* (Cambridge University Press, New York).

McFadden, Daniel, 1973, Conditional logit analysis of qualitative choice behavior, in Paul Zarembka, ed.: *Frontiers in Econometrics* (Academic Press, New York).

McMillen, Daniel P., and John F. McDonald, 2002, Land values in a newly zoned city, *Review of Economics and Statistics* 84, 62–72.

Michaels, Adrian, and Gary Silverman, 2003, Fed seeks to clarify the rules on "tying", *Financial Times*, August 26, 25.

Ongena, Steven, and David Smith, 2000, Bank relationships: A review, in Patrick Harker and Stavros Zenios, eds.: *The Performance of Financial Institutions: Efficiency, Inovation, and Regulation* (Cambridge University Press, Cambridge and New York).

Puri, Manju, 1994, The long term default performance of bank underwritten security issues, *Journal of Banking and Finance* 18, 397–418.

Puri, Manju, 1996, Commercial banks in investment banking: Conflict of interest or certification role? *Journal of Financial Economics* 40, 373–401.

Puri, Manju, 1999, Commercial banks as underwriters: Implications for the going public process, *Journal of Financial Economics* 54, 133–163.

Rajan, Raghuram, 2002, An investigation into the economics of extending bank powers, *Journal of Emerging Market Finance* 1, 125–156.

Rosenbaum, Paul, and Donald Rubin, 1983, The central role of the propensity score in observational studies for causal effects, *Biometrika* 70, 41–55.

Rubin, Donald, 1997, Estimating causal effects from large data sets using propensity scores, *Annals of Internal Medicine* 127, 757–763.

Santomero, Anthony M., and David L. Eckles, 2000, The determinants of success in the new financial services environment, *FRBNY Economic Policy Review*, October, 11–23.

Saunders, Anthony, and Ingo Walter, 1994, *Universal Banking in the United States. What Could We Gain? What Could We Lose?* (Oxford University Press, New York).

Smith, Randall, 2001a, Lucent deal shows Wall Street takes on greater risk, *Wall Street Journal* February 23, C1.

Smith, Randall, 2001b, Morgan Stanley injects about $2 billion into bank unit, aiming to boost lending, *Wall Street Journal* August 16, B7.

Stefanadis, Chris, 2004, Tying, exclusivity, and universal banking, Working paper, Rice University.

Yasuda, Ayako, 2005, Do bank relationships affect the firm's underwriter choice in the corporate-bond underwriting market? *Journal of Finance* 60, 1259–1292.