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Bank Underwriting of Debt Securities: Modern Evidence

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This article examines debt securities underwritten by Section 20 subsidiaries of bank holding companies relative to those underwritten by investment houses. Consistent with a net certification effect for banks, bank underwriting of lower credit rated firms to whom the bank lends results in relatively higher prices (lower yields). We find no evidence of conflicts of interest even when an issue is used to repay bank debt. Further, banks bring a relatively larger proportion of small issues to the market. Contrary to the contention that universal banking stunts availability of finance to small firms, bank underwritings appear to benefit small firms.

There has been an extensive debate in the United States regarding the degree and the form of partici-

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pation by commercial banks in the underwriting of corporate securities. Commercial banks have been effectively prohibited from underwriting corporate securities by the Glass–Steagall provisions of the Banking Act of 1933, amidst concerns that combining the underwriting of these securities with lending activities presented a potential conflict of interest that was detrimental to investors.

In 1987 the Glass–Steagall provisions were relaxed, with some banks (e.g., J. P. Morgan, Bankers Trust Co.) being allowed by the Federal Reserve to set up Section 20 subsidiaries which can underwrite corporate securities. These Section 20 subsidiaries (referred to as *banks* in this article) are subject to a substantial set of *firewalls*, that limit information, resource and financial linkages between them and their respective parent holding companies as well as with their commercial banking affiliates. In addition, these subsidiaries were also limited to generating a maximum of 10% of their gross revenues from underwriting corporate securities. Proposals by the Office of Comptroller of the Currency intend to make it even simpler for commercial banks to expand into other nonbanking businesses, such as trading securities, selling real estate, insurance, and computer services. Recently the Federal Reserve has raised the limit on revenue generation from securities activities of commercial bank holding companies to 25% from the current 10%. It also dropped some of the firewalls. These relaxations are a further indication of the likelihood of banks expanding their nonbanking businesses in the future.[1] This raises questions regarding the public benefits and costs of relaxing the Glass–Steagall provisions and other regulations limiting the ability of U.S. banking organizations to expand their nonbank product set.

This article contributes to this discussion by examining the pricing and other characteristics of bank and investment house underwritings in the post-Section 20 era. It also contributes to the discussion of the optimal organizational form for bank underwritings in the post-Section 20 era.

There is a limited literature on the pricing of public security issues based on whether an underwriter is a commercial bank or an investment house. On the theoretical front, Puri (1996b) finds conditions under which a commercial bank and an investment house would, in equilibrium, price the same issue differently. The intuition for this finding can be summarized in the following manner: when

[1] For a complete discussion of the scope and limitations of firewalls on activities of Section 20 subsidiaries, see GAO (1990). For the proposal by the Comptroller of Currency's office see the Business section of the *New York Times*, November 29, 1994; for recent relaxations in the regulations surrounding Section 20 subsidiaries see the Economy section of the *Wall Street Journal*, August 1, 1996. Initially banks expanded into commercial paper in 1987, corporate debt in 1989, with equity following in 1990.

the proceeds of a debt issue are being used to refinance existing bank debt, and the underwriter is a commercial bank whose loans are being refinanced, there is a potential conflict of interest present. The commercial bank, in its role as underwriter, could try to misrepresent the quality of the security to potential buyers.[2] If the potential buyers are not naive, they realize that such a conflict might exist and therefore will adjust the price they are willing to pay for the securities in a downward direction. On the other hand, a commercial bank with a lending relationship with the issuer has the potential to efficiently obtain more accurate information on the issuer than an investment house (which has no lending exposure to the issuer). Thus, there is a trade-off: a commercial bank underwriter might have better information than an investment bank underwriter, but it might misrepresent this information to the market. When the benefit of having better information outweighs the potential conflict of interest then the commercial bank underwriter can be viewed as providing a net certification effect to investors. For example, firms issuing junior and more information-sensitive securities may receive higher prices when a bank underwrites them than when such securities are underwritten by an investment house. This is because of the perceived monitoring advantages of the bank that are a by-product of its lending activities.

The empirical evidence on the conflicts of interest in the pre-Glass–Steagall period, when there were no firewalls between a bank and its securities subsidiary, has been studied in two ways. First, several studies examine the long-run performance of bank underwritten issues as compared to investment house underwritten issues [(see Ang and Richardson (1994), Kroszner and Rajan (1994), Puri (1994)]. These studies find that commercial bank underwritten securities had a better default record in the long term than investment house underwritten securities (despite the potential conflicts of interest that were present). Second, Puri (1996a) examines ex ante pricing of corporate debt in the immediate pre-Glass-Steagall period and finds that issuers of commercial bank underwritten securities obtained higher prices ex ante than those obtained by (similar) investment house underwritten securities. This supports banks having a net certification effect that dominated any conflict of interest effect. This evidence along with the long-run performance of these issues also supports the view that investors an-

[2] The basic distinction between a commercial bank and an investment house is that an investment house underwrites securities but does not make loans, whereas a commercial bank does both. Fama (1985) argues that bank loans are a form of inside debt since the commercial bank has access to information that is not publicly available. Commercial banks acquire such private information from monitoring loans. For example, they inspect factory premises and inventory or they may be privy to investment opportunities available to the firm. On the other hand, investment houses must expend resources in collecting information. For a detailed discussion of the various kinds of potential conflicts of interest, see Saunders (1985), Benston (1990), Saunders and Walter (1994), and Walter (1985).

ticipated correctly the higher quality of bank underwritten issues.

In the light of recent developments regarding the possible expansion of nonbanking activities of banks, and the possibility of conflicts of interest, an important policy question relates to the characteristics and pricing of securities underwritten by banks and investment houses in the post-Section 20 period. Specifically our article addresses the following issues: (i) What are the characteristics of the securities underwritten by banks as compared to those underwritten by investment houses? (ii) Is there a difference in the pricing of bank and investment house underwritings and, if so, what are the implications regarding conflicts of interest and certification effects? (iii) What evidence do our results provide regarding the efficacy of firewalls in the prevention of conflicts of interest?

This article differs from the previous empirical literature in the following ways: First, it focuses on the use of the proceeds of debt issues. In particular, we analyze the conflict of interest and the certification effects by examining separately the pricing of debt underwritings when the purpose of the issue is (i) to refinance existing bank debt, and (ii) not for refinancing existing bank debt (i.e., all other reasons). Such an analysis would be extremely difficult in the pre-Glass–Steagall era since information on the purpose of the issue, while stated, was extremely noisy, given that stringent disclosure rules (such as those provided in the Securities Act of 1934) did not exist. Second, in the analysis below we explicitly control for the underlying lending relationship of the bank (through its commercial banking affiliate). Third, our article provides evidence on the implications of organizational form for the pricing of debt securities underwritten by banks as compared to those underwritten by investment houses.

The main results of the article are as follows: We find that 31% of bank underwritings are of smaller issues (less than $75 million in size), whereas only 8% of investment house underwritings are of smaller issues. Further, over time, as banks have gained underwriting experience, the average issue size that banks have underwritten has declined in absolute terms as well as relative to the average size of issues underwritten by investment houses. This evidence is consistent with a positive role of banks in bringing smaller issuers to the market and is contrary to the contention that greater (universal) banking powers may stunt small firm access to the capital market. We also find that bank underwritings, where the bank holds a significant lending stake (through its commercial banking affiliate), reduces yield spreads by 27 basis points for lower-credit rated issues (Caa-Ba3).[3] This finding is consis-

[3] The reduction of 27 basis points is per unit of the natural log of the bank's outstanding loans to the firm.

tent with the view that bank association is valuable for such issuers due to the bank's dominant certification effect. Where debt securities are issued, for purposes other than repaying existing bank debt, and where the bank retains a significant lending stake (through its commercial banking affiliate), yield spreads are reduced by 42 basis points for lower-credit (Caa-Ba3) rated issues. Where the stated purpose of an issue is to refinance existing bank debt, there is no statistically significant difference between yield spreads on similar debt issues underwritten by banks and investment houses. These results are consistent with a dominant net-certification effect of bank underwritings.

The rest of the article is organized as follows. We describe the data and sample selection in Section 1. We develop testable hypotheses in Section 2. In Section 3 we explain our test methodology. Section 4 discusses the empirical results. Section 5 concludes.

1. Data and Sample Selection

We employ the following criteria for the selection of the sample period. First, the sample needs to consist of both bank and investment house underwritings — that is, the sample should begin no earlier than January 1989, when J. P. Morgan Securities (the Section 20 subsidiary of J. P. Morgan Inc.) underwrote the first public corporate bond issue by a bank since the Glass–Steagall Act. Second, to ensure that the test results are representative, the sample must have a nontrivial number of issues underwritten by banks. Third, in devising econometric tests examining bank-specific effects, it is necessary to control for other factors such as the issuer's credit rating, size of the issue, purpose of the issue, underlying security (collateral), underlying lending relationship, maturity, and the term structure of risk-free (treasury) yields. Data on these variables must also be available for the entire sample period. Finally, the sample should be selected from a period during which there was relative stability in economic and regulatory conditions.

Based on these considerations, we define our sample period as January 1, 1993 to March 31, 1995 — approximately $2\frac{1}{4}$ years. We exclude financial firms (one-digit SIC code 6) and firms in regulated industries (one-digit SIC code 4) from our study since: (i) the nature of any conflict of interest among financial firms may be significantly different from that among nonfinancial firms, and (ii) the absence of regulation contrasts firms in nonregulated industries from those in regulated industries. Additionally, we focus on the top 20 underwriters (rankings based on dollar value of underwritings) of fixed-rate nonconvertible debt. For our sample, 4 of the top 20 underwriters

are Section 20 subsidiaries of money center banks, namely J. P. Morgan, Bankers Trust, Citibank, and Chase Manhattan Bank. Our sample consists of 670 fixed-rate U.S. nonconvertible debt issues. Of these 80 (approximately 12%) issues were underwritten by Section 20 subsidiaries.

Information about these issues, such as date of issuance, offering yield to maturity, the principal underwriter, syndicate members, the underlying collateral, the size of the issue, the maturity of the debt, etc., was obtained from the Securities Data Corporation, Inc. (SDC). The sample is constructed from the U.S. domestic public new-issues database of SDC. The SDC database is compiled from regulatory filings, news sources, company press releases, and prospectuses.[4]

However, the SDC database does not tell us which companies have bank loans outstanding. For this purpose we use the Dealscan database compiled by the Loan Pricing Corporation. This database comprises information about loans over $100,000 in size to firms filing SEC 13-Ds, 14-Ds, 13-Es, 10-Ks, 10-Qs, 8-Ks, and registration filings (S-series filings) which were outstanding at the beginning of our sample period.[5] The database consists largely of publicly held companies, and privately held companies with public debt outstanding, which are required to file these forms with the SEC.

The dependent and independent variables are explained in the next section. Appendix A.1 to this article provides a complete description of the construction of these variables from the SDC and the Dealscan databases.

2. Test Hypotheses

2.1 Characteristics

We examine the impact of greater universal banking powers on smaller firms in terms of their capital market access. A possible hypothesis is that greater universal banking powers stunt capital market access to smaller firms since larger banks tend to concentrate customer relationships on larger firms/clients.[6] Alternately, banks, through the private information at their disposal, and their certification role as monitors, can potentially help smaller firms gain greater access to the capital market.

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[4] SDC claims that it double-checks public sources by surveying underwriters, financial advisors, law firms, and other deal makers.

[5] We thank Mark Carey for assisting us with the Dealscan database.

[6] This concern has been raised at various times regarding German universal banks.

2.2 Pricing of bank versus investment house underwritings

We also analyze the pricing of debt securities underwritten by Section 20 subsidiaries relative to those underwritten by investment houses. Specifically, the current organizational form of a Section 20 subsidiary is similar to a regular bank holding company affiliate, but with more restrictions on its activities. This is due to the presence of a set of firewalls which severely limit the informational, financial, and real resource interlinks among the Section 20 subsidiary, the bank holding company (parent), and its commercial banking affiliate. If these firewalls are binding — that is, if they prevent conflict of interest exploitation and informed certification — one may expect to find no significant difference in the pricing of similar securities among investment houses and Section 20 subsidiaries.[7] However, if these firewalls are nonbinding and if the informed certification effect of banks outweighs any potential conflict of interest effects, we should expect to find bank underwritings priced higher (have lower yields) than similar investment house underwritings. Alternatively, if potential conflicts of interest are perceived by investors to be greater than any informed certification effect, bank underwritings will be priced lower (have higher yields) than similar issues underwritten by investment houses. Thus our results provide insights regarding the relative strength of any certification and conflict of interest effects, as well as the efficacy of firewalls.

We hypothesize that, should conflicts of interest be present, they are most likely to be found in cases where the purpose of an issue is to refinance existing bank loans. In particular, yields should be highest on debt issues underwritten by banks (relative to those of similar underwritings by investment houses) whose purpose is to refinance bank loans. Further, since any potential conflict of interest will depend on the extent of the underlying lending exposure of the commercial banking affiliate — the higher the lending exposure of the commercial banking affiliate the higher will be required yield spreads (since rational investors impound any such potential conflicts of interest into a security's price).

We also hypothesize that where conflict of interest incentives are potentially small or are absent, that is, where debt securities are not issued for the purpose of refinancing bank loans, there may be a positive role for an informed certification effect by banks. In other words, yields should be lowest on bank underwritings (relative to those of similar underwritings by investment houses) of those debt

[7] This assumes similar distributional abilities across banks and investment houses. The fact that our sample period starts 4 years after the granting of debt underwriting powers gives Section 20 subsidiaries sufficient time to have established distributional channels for underwriting new issues by themselves.

issues whose purpose is not to refinance existing bank debt. Further, such informed certification will depend on the extent of the underlying lending exposure of the commercial banking affiliate, that is, the higher its lending exposure, the higher is the informed certification effect and hence the lower will be yield spreads (since rational investors are willing to pay more for the informed certification of the issuer).

3. Methodology

3.1 Characteristics

In our study we use univariate t tests and probit regression models to examine the characteristics of bank versus investment house underwritings. The dependent variable for the probit regressions is BANK which is a dummy variable that takes the value of 1 if the lead underwriter is a bank (Section 20 subsidiary) and 0 otherwise (an investment house). The independent variables for the probit regression are the same as those for the linear regressions (described in the next section 3.2).

3.2 Pricing of bank versus investment house underwritings

We use linear regression models to examine the determinants of ex ante yield premiums on debt securities. The construction of the variables from the SDC and Dealscan databases is explained in Appendix A.1. The dependent variable BPS (basis points spread) is the premium of the ex ante yield spread of a debt security over the ex ante yield of a U.S. Treasury security of comparable maturity. The independent variables used to explain this spread are

LN(STAKE): The natural log of 1 plus STAKE, the outstanding lending exposure to the issuer (in millions of dollars) by the commercial banking affiliate of the Section 20 subsidiary.[8]

EXCHANGE: A dummy variable that takes the value 1 if the firm is listed on an exchange and 0 otherwise.

LN(AMOUNT): The natural log of the size of the issue (in millions of dollars).

REF BK DEBT: A dummy variable that is 1 if the purpose of the issue is to refinance existing bank debt and 0 otherwise.

[8] By construction, STAKE is positive for all bank underwritings with outstanding lending exposure by the commercial banking affiliate of the underwriting Section 20 subsidiary and 0 for all other underwritings (including all investment house underwritings). We also use another measure PROP(STAKE) = STAKE/AMOUNT for the outstanding lending exposure, where STAKE is the outstanding lending exposure to the issuer by the commercial banking affiliate of the underwriting Section 20 subsidiary and AMOUNT is the size of the issue.

SECURED: A dummy variable that is 1 if the issue has underlying collateral and 0 otherwise. This variable is created based on the description of the security.

NEW ISSUE: A dummy variable that is 1 if the issue is a first-time issue by the firm (a debt IPO). This variable is created in the following manner: If the company did not have a debt issue during the 20 years prior to the sample period, it is assumed to be a first-time issue.

INDUSTRY: Stands for a set of industry dummy variables based on one-digit primary SIC codes. For example, if the primary SIC code is 861, the one-digit primary SIC code is 8. The corresponding dummy variable is 1 and all other industry dummy variables are 0.

CREDIT RATING: Stands for a set of seven credit rating dummy variables (Caa-C, B1-B3, Ba1-Ba3, Baa1-Baa3, A1-A3, Aa1-Aa3, Aaa) based on Moody's credit rating for the debt issue. For example, B1–B3 is a dummy variable which is 1 if Moody's credit rating for the issue is B1, B2, or B3. The dummy variable is 0 otherwise.

REPUTATION: Three dummy variables based on the market share rank of dollar volume of underwritings of debt issues in our sample. LOWREP is 1 if the rank based on market share is between 16 and 20. MEDREP is 1 if the rank is between 11 and 15. HIREP is 1 if the rank is between 1 and 10. The dummy variables are 0 otherwise.

MATURITY: Stands for three dummy variables based on the maturity of the security. We classify the security issues into three separate categories based on the maturity and form three dummy variables. LOWMAT is 1 if the security matures in less than 5 years. MEDMAT is 1 if it matures in 5 to 15 years. HIMAT is 1 if the maturity is greater than 15 years. The dummy variables are 0 otherwise.

3.3 Discussion of variables

The credit rating of the issue is clearly important. One would expect that higher-credit rated issues should have lower yield spreads over Treasuries than lower-credit rated issues. As larger offerings are likely to be associated with less uncertainty than smaller offerings, be more liquid, and have more public information associated with them, one would also expect larger issues to have lower yields. A new (debt IPO) issue is potentially associated with greater uncertainty than a seasoned issue and should result in relatively higher yield spreads. Underlying security (collateral) may affect the yield spread either positively or negatively. The practitioner's view associates a large amount of collateral with a higher degree of issuer riskiness, and hence should be associated with higher yields, that is, collateral and ex ante yield

spread are positively related [see, e.g., Berger and Udell (1990)]. Alternatively, a large amount of collateral enhances the amount investors expect to receive in the event of an issuer default. In such a case, collateral and ex ante yield spread may be negatively related. The purpose (or use of funds) of the issue can also potentially affect the ex ante yield spread. In particular, where the purpose is to refinance existing bank debt, and investors believe firewalls are nonbinding (i.e., that the firm has been induced to issue new public debt to pay down existing bank loans that are at risk), one would expect a positive effect on the yield spread.[9] Underwriter reputation is also important [see Beatty and Ritter (1986)] and one would expect a high reputation to reduce yield spreads. Further, one might also expect reputation to, in part, proxy for placing ability and/or distribution network. Maturity is another variable potentially affecting spreads. In particular, if the probability of default increases with debt maturity [see Flannery (1986)] then we should expect to see higher yield spreads with longer maturity issues. A firm listed on an exchange is associated with more information production, and one would expect a debt issue of such a firm to have lower yield spreads (priced higher). Finally, the impact on yield spreads of a bank underwriting a debt issue while an underlying lending relationship exists (through its commercial banking affiliate) relative to a similar issue underwritten by an investment house with no direct or indirect lending powers[10] is measured by the magnitude and the significance of the coefficient on the LN(STAKE) variable [and alternatively, of the coefficient on PROP(STAKE)]. In the absence of conflicts of interest and certification effects, and with firewalls binding, this variable should have no significant effect on yield spreads.

4. Empirical Results

4.1 Characteristics

We find that banks are more likely than investment houses to underwrite smaller issues. For example, 31% (25 out of 80 cases) of bank underwritings in our sample were less than $75 million in size, whereas 8% (47 out of 590 cases) of investment house underwritings were less

[9] However, if the firewalls are not breached, discontinuation (or a reduction) of the bank's lending association with a customer may be a potentially negative signal of the firm's prospects such that investors demand higher yields. While there is no evidence on the effect of nonrenewal of lending decisions on stock returns, Lummer and McConnell (1989) find that renewal of loans, even on worse terms, to distressed firms have a positive announcement effect, that is, some loans are better than no loans. James (1987) also finds a significant announcement effect for private placement debt issues used to repay loans.

[10] It might be noted that some investment banks have recently set up wholesale lending units to compete with banks. However, there is currently no publicly available information on the range of these activities.

than $75 million in size (see Table 1). Using a univariate *t* test, we find that this difference is significant at the 1% level. We also conducted a univariate test of the difference in average issue size of bank and investment house underwritings. The mean issue size of bank underwritings was $107 million, whereas that of investment houses was $189 million. The difference is statistically significant at the 1% level. This result is consistent with the view that established investment houses have neglected smaller issuers. While it may be true that Section 20 subsidiaries of the commercial banks were new to underwriting, and may have been forced initially to focus on smaller issues to gain expertise — our sample period starts 4 years after the granting of debt underwriting powers, which presumably would have allowed them sufficient time to establish distributional channels for underwriting all sizes of issues and to gain the necessary expertise to compete with investment banks for larger issues if they so chose. As an additional check, we also examine the trends in average issue size underwritten by banks over time. The average issue size underwritten by banks actually declined over time in absolute terms from $137.50 million in the first quarter of 1993 to $54.55 million in the first quarter of 1995 (see Table 2). In relative terms, the average issue size underwritten by banks was 64% of the average issue size underwritten by investment houses in the first quarter of 1993, declining to 23% in the first quarter of 1995. Since small-size issues are usually associated with smaller companies, we find evidence consistent with banks playing a positive role in bringing debt issues of smaller companies to the capital market. That is, there is no evidence that greater universal banking powers of banking organizations has stunted capital market access for such firms.

We also find evidence that banks bring a larger proportion of lower-credit rated (Caa-Ba3) issuers to the market than investment houses, both in terms of number of issues (43% as compared to 38%) and the dollar volume of such issues (52% as compared to 36%), which supports the view that bank underwriting is net beneficial to such firms.

The probit results (see Table 3) provide further corroboration. The probit results suggest that the main factor determining whether a bank underwrites a debt issue is the smallness of issue size. In addition, banks do not have a higher probability of underwriting debt issues whose purpose is to refinance existing bank debt than investment houses.

4.2 Pricing results

We included all the variables discussed in Section 3 in our multivariate linear regression. The results in the following three cases are summarized below: (i) all debt issues, (ii) all debt issues whose purpose is

Table 1
Descriptive statistics of our sample

	Bank Issues		Investment House Issues		All Issues	
Segment	No.	Volume ($m)	No.	Volume ($m)	No.	Volume ($m)
Issue Size						
Small	25	418.00	47	1,990.00	72	2,408.00
Medium	49	6,410.00	385	50,328.90	434	56,378.90
Large	6	1,725.00	158	58,977.90	164	60,702.90
Maturity						
Low	8	365.00	58	8,046.70	66	8,411.70
Medium	64	7,228.00	403	75,268.40	467	82,496.40
High	8	960.00	129	27,981.70	137	28,941.70
Exchange-listed						
Yes	61	5,665.00	423	77,427.80	484	83,092.80
No	19	2,888.00	167	33,869.00	186	36,757.00
Credit Rating						
Caa-Ba3	34	4,435.00	221	40,351.10	225	44,786.10
Baa1-Aaa	46	4,118.00	369	70,945.70	415	75,063.70
Secured						
Yes	13	1,980.00	94	14,751.30	107	16,731.30
No	67	6,573.00	496	96,545.50	563	103,118.50
New Debt Issues						
Yes	28	3,646.00	199	32,739.10	227	36,385.10
No	52	4,907.00	391	78,557.70	443	83,464.70
Reputation						
Low	5	435.00	10	1,190.00	15	1,625.00
Medium	46	4,168.00	23	3,350.00	69	7,518.00
High	29	3,950.00	557	106,756.80	586	110,706.80
Total	80	8,553.00	590	111,296.80	670	119,849.80

This table classifies our sample based on (1) issue size into small (less than $75 million), medium (between $75 million and $150 million) and large (greater than $150 million) segments, (2) maturity into low (less than 5 years), medium (between 5 and 15 years), and high (greater than 15 years) segments, (3) whether the firm is listed on an exchange, (4) based on Moody's credit rating into lower-credit rated (Caa-Ba3) and higher-credit rated (Baa1-Aaa) categories, (5) whether secured, (6) whether a new debt issue, and (6) a reputation measure determined by the market share rank of the dollar volume of underwriting into low (ranked between 16 and 20), medium (ranked between 11 and 15), and high (ranked between 1 and 10). In addition, within each of these segments, the issues are classified as bank (Section 20) underwritings and investment house underwritings.

to refinance existing bank debt, and (iii) all debt issues whose purpose is not to refinance existing bank debt. As stated above, potential conflicts of interest should be most prominent in the group (ii) issues.

4.2.1 All debt issues. Specifically, we run the regression

$$\begin{aligned}\text{BPS} = {} & \beta_0 + \beta_1 \text{LN(STAKE)} + \beta_2 \text{EXCHANGE} + \beta_3 \text{LN(AMOUNT)} \\ & + \beta_4 \text{REF BK DEBT} + \beta_5 \text{SECURED} + \beta_6 \text{NEW ISSUE} \\ & + \beta_{\text{ind}} \text{INDUSTRY} + \beta_{\text{cr}} \text{CREDIT RATING} \\ & + \beta_{\text{rep}} \text{REPUTATION} + \beta_{\text{mat}} \text{MATURITY}. \end{aligned} \quad (1)$$

Table 2
Average issue size over time and by underwriter type

Year: Quarter	Bank Issues (average issue size, $m)	Investment House Issues (average issue size, $m)
1993:Q1	137.50	215.78
1993:Q2	149.80	193.17
1993:Q3	133.50	173.60
1993:Q4	89.46	193.70
1994:Q1	108.00	172.94
1994:Q2	125.70	168.35
1994:Q3	86.00	162.62
1994:Q4	59.17	166.81
1995:Q1	54.55	232.81
1993–1995(Q1)	106.91	188.64

This table presents the average issue size (in millions of dollars) of debt securities underwritten by banks and investment houses for each quarter for our sample period.

The regression results[11] are presented in Table 4. We find that controlling for the underlying lending relationship, there is no statistically significant difference between the yield spreads on similar debt issues underwritten by banks and investment houses [i.e., the coefficient on the variable LN(STAKE) is not statistically significant]. As hypothesized in Section 4.3, we find that higher-credit rated issues lead to lower yield spreads — the coefficient on the credit rating dummies are positive and decline for higher-credit rating dummies. The coefficients on other independent variables have the expected signs (see Section 4.3) and are statistically significant or marginally significant in most cases.

When we divided the sample by credit ratings, bank underwritings relative to investment house underwritings reduce yield spreads by 27 basis points for lower-credit rated (Caa-Ba3) issues (see Table 5) for a one-unit increase of LN(STAKE). Based on the definition of LN(STAKE), and since one unit of LN(STAKE) translates to $1.7183 million of lending exposure, bank underwritings reduce yield spreads by 16 basis points per $1 million of lending exposure to the issuer (through its commercial banking affiliate). This finding is consistent with the view that bank association is valuable for lower-credit rated issues due to a net certification effect that dominates any potential conflict of interest effect. We also used another measure of outstanding lending exposure, as a proportion of the issue size, PROP(STAKE) = (STAKE/AMOUNT). The results are qualitatively similar.

[11] We have seven credit ratings, only six of which can be included to avoid linear dependence. We exclude the Aaa dummy in this regression. For the same reason, we exclude LOWREP, MEDMAT, and the industry dummy corresponding to the one-digit SIC code 9 in all the linear regressions.

Table 3
Probit estimations — bank versus investment house underwritings

Variable	Coefficient	T ratio
INTERCEPT	−1.24	−0.01
LN(STAKE)	2.58	0.07
EXCHANGE	−0.32	−1.54
LN(AMOUNT)	−0.70	−5.93[a]
SECURED	−0.09	−0.44
REF BK DEBT	0.17	1.05
NEW ISSUE	0.12	0.07
LOWMAT	−0.89	−2.19[c]
HIMAT	−0.19	−0.84
p-value	0.0000	
Observations	670	
Pseudo R^2	0.3840	

This table presents results of the probit regression. The dependent variable is a dummy variable, BANK, assigned the value 1 if the lead underwriter is a Section 20 subsidiary. The independent variables used in this table are LN(STAKE) is the natural log of 1 plus STAKE, the outstanding lending exposure by the commercial banking affiliate of the bank underwriter (Section 20 subsidiary) to the issuer at the time of issuance of the debt issue. EXCHANGE is a dummy variable which is 1 if the firm is listed on an exchange. LN(AMOUNT) is the natural logarithm of the offered dollar amount of the issue (in millions of dollars). SECURED is a dummy variable which is 1 if the issue is secured. REF BK DEBT is a dummy variable which is 1 if the purpose of the issue is to refinance existing bank debt. NEW ISSUE is a dummy variable which is 1 if the issue is a first time issue. INDUSTRY is a the set of industry dummy variables constructed based on one digit SIC codes. MATURITY stands for three dummy variables based on maturity of the security. LOWMAT is 1 if the issue matures in less than 5 years, MEDMAT is 1 for 5 to 15 years, and HIMAT is 1 if the maturity is greater than 15 years. All dummy variables are 0 otherwise. Pseudo R^2 is the likelihood ratio computed as $R^2 = 1 - \log L / \log L_0$ where $\log L$ is the maximized value of the log-likelihood function, $\log L_0$ is the log-likelihood computed only with a constant term. The point estimates and T ratios for the industry dummys are not reported though they are included in the regressions. The estimation was also conducted with the full set of independent variables. The results are qualitatively similar. a, b, and c stand for significant at 0.01, 0.025, and 0.05 level using a two-tailed test.

We next looked at whether this holds true across different credit rating classes, when the purpose of the issue is (i) to refinance existing bank debt, and (ii) not to refinance existing bank debt.

4.2.2 Debt issues whose purpose is to refinance existing bank debt. As hypothesized earlier, if conflicts of interest are present, they are most likely to be found in cases where the purpose of an issue is to refinance existing bank debt. Specifically, we run the following regression across each credit rating category (Caa-Ba3 versus Baa1-Aaa) for those debt issues whose purpose is to refinance existing bank debt:

$$\text{BPS} = \beta_0 + \beta_1 \text{LN(STAKE)} + \beta_2 \text{EXCHANGE} + \beta_3 \text{LN(AMOUNT)}$$

Table 4
Multivariate tests for bank versus investment house underwritings

Variable	Coefficient	*T* ratio
INTERCEPT	68.73	1.44
LN(STAKE)	−5.28	−1.51
EXCHANGE	−22.05	−2.86[a]
LN(AMOUNT)	−5.39	−1.47
REF BK DEBT	14.33	2.49[b]
SECURED	21.69	2.74[a]
NEW ISSUE	19.41	2.87[a]
Ca-C	522.21	12.77[a]
B1-B3	395.76	13.36[a]
Ba1-Ba3	247.15	8.15[a]
Baa1-Baa3	67.84	2.32[b]
A1-A3	31.83	1.10
Aa1-Aa3	18.72	0.62
LOWREP	−10.05	−0.50
HIREP	−23.38	−2.26[b]
LOWMAT	−20.75	−1.92
HIMAT	25.75	3.32[a]
Observations	670	
Adjusted R^2 = 0.8669		

This table gives the OLS estimates of the following equation:

$$\begin{aligned}\text{BPS} = {} & \beta_0 + \beta_1 \text{ LN(STAKE)} + \beta_2 \text{ EXCHANGE} + \beta_3 \text{ LN(AMOUNT)} + \beta_4 \text{ REF BK DEBT} \\ & + \beta_5 \text{ SECURED} + \beta_6 \text{ NEW ISSUE} + \beta_{\text{ind}} \text{ INDUSTRY} + \beta_{\text{cr}} \text{ CREDIT RATING} \\ & + \beta_{\text{rep}} \text{ REPUTATION} + \beta_{\text{mat}} \text{ MATURITY}.\end{aligned}$$

The dependent variable BPS is the premium of the ex ante yield of a security over the ex ante yield of a Treasury of comparable maturity in basis points. The independent variables are LN(STAKE) is the natural log of 1 plus STAKE, the outstanding lending exposure by the commercial banking affiliate of the bank underwriter (Section 20 subsidiary) to the issuer at the time of issuance of the debt issue. EXCHANGE is a dummy variable which is 1 if the firm is listed on an exchange. LN(AMOUNT) is the natural logarithm of the offered dollar amount of the issue (in millions of dollars). REF BK DEBT is a dummy variable which is 1 if the purpose of the issue is to refinance existing bank debt. SECURED is a dummy variable which is 1 if the issue is secured. NEW ISSUE is a dummy variable which is 1 if the issue is a first-time issue. INDUSTRY is a set of industry dummy variables constructed based on one digit SIC codes. CREDIT RATING is a set of credit rating dummy variables. For example, B1–B3 is a dummy variable which is 1 if Moody's credit rating for the issue is B1, B2, or B3. REPUTATION stands for three dummy variables based on market share rank of dollar volume of underwritings of debt issues in our sample. We consider the issues underwritten by the top 20 underwriters in this study. LOWREP is 1 if the rank based on market share is between 16 and 20. MEDREP is 1 if the rank is between 11 and 15. HIREP is 1 if the rank is between 1 and 10. MATURITY stands for three dummy variables based on maturity of the security. LOWMAT is 1 if the issue matures in less than 5 years, MEDMAT is 1 for 5 to 15 years, and HIMAT is 1 if the maturity is greater than 15 years. All dummy variables are 0 otherwise. The point estimates and *T* ratios for the industry dummys are not reported though they are included in the regressions. a, b, and c stand for significant at 0.01, 0.025 and 0.05 level using a two-tailed test.

$$\begin{aligned}& + \beta_4 \text{ SECURED} + \beta_5 \text{ NEW ISSUE} + \beta_{\text{ind}} \text{ INDUSTRY} \\ & + \beta_{\text{rep}} \text{ REPUTATION} + \beta_{\text{mat}} \text{ MATURITY}. \qquad (2)\end{aligned}$$

We find the LN(STAKE) is economically and statistically insignificant (see Table 6) at any meaningful level of significance. This is consistent with investors perceiving either an absence of conflicts of

Table 5
Multivariate tests for bank versus investment house underwritings of debt issues segmented by credit rating category

	Caa-Ba3		Baa1-Aaa	
Variable	Coeff	T ratio	Coeff	T ratio
INTERCEPT	591.54	5.36[a]	56.27	4.37[a]
LN(STAKE)	−27.21	−2.93[a]	0.63	0.28
EXCHANGE	−63.85	−3.72[a]	−17.98	−2.95[a]
LN(AMOUNT)	−32.63	−2.35[b]	−1.16	−0.53
REF BK DEBT	32.41	2.09[c]	13.23	3.64[a]
SECURED	28.10	1.60	15.42	2.32[b]
NEW ISSUE	28.53	1.67	14.61	3.19[a]
LOWREP	−41.94	−0.91	−20.53	−1.38
HIREP	−46.47	−2.09[c]	0.11	0.01
LOWMAT	*	*	−21.67	−4.07[a]
HIMAT	−98.72	−1.11	18.59	4.92[a]
Observations	255		415	
Adjusted R^2	0.2099		0.2689	

This table gives the OLS estimates of the following equation:

$$\text{BPS} = \beta_0 + \beta_1 \text{LN(STAKE)} + \beta_2 \text{EXCHANGE} + \beta_3 \text{LN(AMOUNT)} + \beta_4 \text{REF BK DEBT} + \beta_5 \text{SECURED} + \beta_6 \text{NEW ISSUE} + \beta_{\text{ind}} \text{INDUSTRY} + \beta_{\text{rep}} \text{REPUTATION} + \beta_{\text{mat}} \text{MATURITY}$$

The dependent variable BPS is the premium of the ex ante yield of a security over the ex ante yield of a treasury of comparable maturity in basis points. The independent variables are LN(STAKE) is the natural log of 1 plus STAKE, the outstanding lending exposure by the commercial banking affiliate of the bank underwriter (Section 20 subsidiary) to the issuer at the time of issuance of the debt issue. EXCHANGE is a dummy variable which is 1 if the firm is listed on an exchange. LN(AMOUNT) is the natural logarithm of the offered dollar amount of the issue (in millions of dollars). SECURED is a dummy variable which is 1 if the issue is secured. NEW ISSUE is a dummy variable which is 1 if the issue is a first time issue. INDUSTRY is a the set of industry dummy variables constructed based on one digit SIC codes. REPUTATION stands for three dummy variables based on market share rank of dollar volume of underwritings of debt issues in our sample. We consider the issues underwritten by the top 20 underwriters in this study. LOWREP is 1 if the rank based on market share is between 16 and 20. MEDREP is 1 if the rank is between 11 and 15. HIREP is 1 if the rank is between 1 and 10. MATURITY stands for three dummy variables based on maturity of the security. LOWMAT is 1 if the issue matures in less than 5 years, MEDMAT is 1 for 5 to 15 years, and HIMAT is 1 if the maturity is greater than 15 years. All dummy variables are 0 otherwise. The point estimates and T ratios for the industry dummys are not reported though they are included in the regressions. The asterisk (*) indicates that none of the issues are of low maturity. a, b, and c stand for significant at 0.01, 0.025, and 0.05 level using a two-tailed test.

interest or that the firewalls were effective in containing the conflict of interest.

4.2.3 Debt issues whose purpose is to not to refinance existing bank debt. Interestingly, in the case when debt proceeds are to be used for purposes other than refinancing bank debt, the effect of bank underwritings (controlling for underlying lending relationship) is to lower yield spreads by 42 basis points — statistically significant at the 1% level (t statistic 2.63) for the lowest credit quality (Caa-Ba3) issues (see Table 7). These results also hold when we employ

Table 6
Multivariate tests for bank versus investment house underwritings of debt issues which are used for refinancing existing bank debt segmented by credit rating category

	Caa-Ba3		Baa1-Aaa	
Variable	Coeff	*T* ratio	Coeff	*T* ratio
INTERCEPT	751.17	6.82[a]	100.39	2.23[c]
LN(STAKE)	−16.09	−1.34	−1.81	−0.43
EXCHANGE	−90.51	−4.09[a]	−25.76	−2.10[c]
LN(AMOUNT)	−48.03	−2.36[b]	−3.35	−0.54
SECURED	−5.05	−0.22	0.52	0.02
NEW ISSUE	15.19	0.67	13.64	1.60
LOWREP	−36.72	−0.68	−14.51	−0.42
HIREP	−73.36	−2.49[b]	1.90	0.08
LOWMAT	*	*	−34.33	−2.59[a]
HIMAT	*	*	18.83	2.55[b]
Observations	144		148	
Adjusted R^2	0.1794		0.0679	

This table gives the OLS estimates of the following equation:

$$\begin{aligned}\text{BPS} = {} & \beta_0 + \beta_1 \text{ LN(STAKE)} + \beta_2 \text{ EXCHANGE} + \beta_3 \text{ LN(AMOUNT)} + \beta_4 \text{ SECURED} \\ & + \beta_5 \text{ NEW ISSUE} + \beta_{\text{ind}} \text{ INDUSTRY} + \beta_{\text{rep}} \text{ REPUTATION} \\ & + \beta_{\text{mat}} \text{ MATURITY}\end{aligned}$$

The dependent variable BPS is the premium of the ex ante yield of a security over the ex ante yield of a treasury of comparable maturity in basis points. The independent variables are LN(STAKE) is the natural log of 1 plus STAKE, the outstanding lending exposure by the commercial banking affiliate of the bank underwriter (Section 20 subsidiary) to the issuer at the time of issuance of the debt issue. EXCHANGE is a dummy variable which is 1 if the firm is listed on an exchange. LN(AMOUNT) is the natural logarithm of the offered dollar amount of the issue (in millions of dollars). SECURED is a dummy variable which is 1 if the issue is secured. NEW ISSUE is a dummy variable which is 1 if the issue is a first time issue. INDUSTRY is a set of industry dummy variables constructed based on one-digit SIC codes. REPUTATION stands for three dummy variables based on market share rank of dollar volume of underwritings of debt issues in our sample. We consider the issues underwritten by the top 20 underwriters in this study. LOWREP is 1 if the rank based on market share is between 16 and 20. MEDREP is 1 if the rank is between 11 and 15. HIREP is 1 if the rank is between 1 and 10. MATURITY stands for three dummy variables based on maturity of the security. LOWMAT is 1 if the issue matures in less than 5 years, MEDMAT is 1 for 5 to 15 years, and HIMAT is 1 if the maturity is greater than 15 years. All dummy variables are 0 otherwise. The point estimates and *T* ratios for the industry dummys are not reported though they are included in the regressions. The asterisk (*) indicates that all issues are of medium maturity. a, b, and c stand for significant at 0.01, 0.025, and 0.05 level using a two-tailed test.

the second (alternative) measure of outstanding lending exposure, PROP(STAKE), as can be seen in Table 8. This yield spread lowering supports a certification effect of banks' underwriting debt issues of relatively risky firms while a lending relationship with the issuer exists (through its commercial banking affiliate).[12] For higher-credit rated

[12] Our conclusion that there is a dominant certification effect in commercial bank underwritings is similar to that of Puri (1996a), but differs from that of subsequent work by Kroszner and Rajan (1997). Puri analyzes, in the pre-Glass-Steagall period, pricing differentials of securities underwritten by commercial banks and investment houses, including those by departments and affiliates

(Baa1-Aaa) issues, we find LN(STAKE) is statistically insignificant.

We also conducted several robustness checks. The first deals with the maturity of issues. We included a continuous variable equal to the maturity of an issue instead of our dummy variables based on short-term and long-term maturity of the debt issue. We also reestimated the regressions using the natural log of maturity. In both cases the results are qualitatively similar. Second, since our definition of reputation might be proxying for the new issue distribution network, and the distribution network might differ between banks and investment houses (as suggested by a referee), we interacted the reputation dummy variables with underwriter type. Our results again are qualitatively similar to those reported earlier. Third, differences in call provisions of bonds underwritten by banks and investment houses may also bias our results. While there are no easy ways to control for call provisions, we perform the following checks: (i) We checked if the presence of call provisions depended on the underwriter type (i.e., whether the underwriter is a bank or an investment house). In our sample, 43% of bank underwritings are callable, whereas 44% of investment house underwritings are callable. The chi-square test fails to reject the null that presence of call provisions is independent of the underwriter type — suggesting that on average, the call provisions of bonds underwritten by banks and investment houses were similar. (ii) We examined the extent of call protection of bonds underwritten by banks and investment houses. The call protection of callable bonds underwritten by banks was 5.27 years as compared to 5.64 years of callable bonds underwritten by investment houses, a difference not statistically significant at the 5% level. (iii) The average call premium on callable bonds underwritten by banks was 4%, marginally higher than the 3.7% premium on callable bonds underwritten by investment houses; however, this difference was also not statistically significant at the 5% level. Thus the evidence shows call provisions were, on average, similar for bank and investment house underwritings. Fourth,

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of commercial banks whereas Kroszner and Rajan (KR) focus solely on the latter dichotomy. KR conclude that conflicts of interest led commercial banks to evolve to an affiliate structure to underwrite securities. However, this interpretation is questionable for the following reasons: First, regulations favored an affiliate structure. Only after the 1927 McFadden Act were national banks explicitly allowed to underwrite securities. Additionally, affiliates could be chartered under state laws as limited liability corporations; could help evade interstate branching restrictions; had no minimal capital requirements; and could do almost anything "except solemnize marriages and perform religious ceremonies" (U.S. Senate, 1934, p. 4776). Finally, KR had no access to direct lending data. Since both departments and affiliates could lend to firms, better prices for affiliate underwritings might simply reflect that affiliates lent more than departments to issuers in their sample. This would support a certification rather than a conflict of interest effect. In contrast, since only banks can lend, it is easier to interpret which effect dominates by comparing bank and investment house underwritings, as in Puri (1996a), or by gathering direct lending data, as done here; both approaches indicate a dominant certification effect.

Table 7
Multivariate tests for bank versus investment house underwritings of debt issues which are not used for refinancing existing bank debt segmented by credit rating category

	Caa-Ba3		Baa1-Aaa	
Variable	Coeff	T ratio	Coeff	T ratio
INTERCEPT	530.91	3.82[a]	39.59	3.04[a]
LN(STAKE)	−41.63	−2.63[a]	3.17	1.20
EXCHANGE	−36.56	−1.23	−14.15	−1.98[c]
LN(AMOUNT)	−29.12	−1.41	−0.32	−0.14
SECURED	47.13	1.52	16.44	2.49[b]
NEW ISSUE	46.99	1.63	17.99	3.29[a]
LOWREP	−138.62	−1.47	−15.98	−0.95
HIREP	−25.86	−0.71	3.54	0.38
LOWMAT	*	*	−15.55	−2.81[a]
HIMAT	−109.92	−1.12	17.55	4.14[a]
Observations	111		267	
Adjusted R^2	0.2219		0.3789	

This table gives the OLS estimates of the following equation:

$$\text{BPS} = \beta_0 + \beta_1 \text{LN(STAKE)} + \beta_2 \text{EXCHANGE} + \beta_3 \text{LN(AMOUNT)} + \beta_4 \text{SECURED} + \beta_5 \text{NEW ISSUE} + \beta_{\text{ind}} \text{INDUSTRY} + \beta_{\text{rep}} \text{REPUTATION} + \beta_{\text{mat}} \text{MATURITY}$$

The dependent variable BPS is the premium of the ex ante yield of a security over the ex ante yield of a treasury of comparable maturity in basis points. The independent variables are LN(STAKE) is the natural log of 1 plus STAKE, the outstanding lending exposure by the commercial banking affiliate of the bank underwriter (Section 20 subsidiary) to the issuer at the time of issuance of the debt issue. EXCHANGE is a dummy variable which is 1 if the firm is listed on an exchange. LN(AMOUNT) is the natural logarithm of the offered dollar amount of the issue (in millions of dollars). SECURED is a dummy variable which is 1 if the issue is secured. NEW ISSUE is a dummy variable which is 1 if the issue is a first time issue. INDUSTRY is a set of industry dummy variables constructed based on one-digit SIC codes. REPUTATION stands for three dummy variables based on market share rank of dollar volume of underwritings of debt issues in our sample. We consider the issues underwritten by the top 20 underwriters in this study. LOWREP is 1 if the rank based on market share is between 16 and 20. MEDREP is 1 if the rank is between 11 and 15. HIREP is 1 if the rank is between 1 and 10. MATURITY stands for three dummy variables based on maturity of the security. LOWMAT is 1 if the issue matures in less than 5 years, MEDMAT is 1 for 5 to 15 years, and HIMAT is 1 if the maturity is greater than 15 years. All dummy variables are 0 otherwise. The point estimates and T ratios for the industry dummys are not reported though they are included in the regressions. The asterisk (*) indicates that none of the issues are of low maturity. a, b, and c stand for significant at 0.01, 0.025, and 0.05 level using a two-tailed test.

another important issue that may affect the difference in yield spreads between bank and investment house underwritings is whether banks bring proportionally more (or fewer) issues to the market during periods of high-yield term spreads and high credit spreads, such as during the first year of our sample. We find that while banks brought 53.75% (43 out of 80) to the market, investment houses brought 60.68% (358 out of 590) of their issues during 1993 (of the initial year of our sample). However, this difference is not statistically significant at the 5% level. The chi-square test fails to reject the null that the timing aspect of the issues is independent of the underwriter type — as a result, we do not expect our results to be affected in any meaningful manner.

Table 8
Multivariate tests for bank versus investment house underwritings of debt issues which are not used for refinancing existing bank debt segmented by credit rating category

	Caa-Ba3		Baa1-Aaa	
Variable	Coeff	T ratio	Coeff	T ratio
INTERCEPT	577.86	4.15[a]	38.65	2.99[a]
PROP(STAKE)	−16.22	−3.21[a]	1.43	1.45
EXCHANGE	−26.47	−0.91	−14.09	−1.97[c]
LN(AMOUNT)	−42.47	−1.97[c]	−0.12	−0.05
SECURED	49.18	1.62	16.21	2.46[b]
NEW ISSUE	53.27	1.92	18.53	3.37[a]
LOWREP	−130.16	−1.41	−16.09	−0.97
HIREP	−15.78	−0.46	3.37	0.38
LOWMAT	*	*	−15.36	−2.78[a]
HIMAT	−96.94	−1.00	17.61	4.16[a]
Observations	111		267	
Adjusted R^2	0.2465		0.3805	

This table gives the OLS estimates of the following equation:

$$\text{BPS} = \beta_0 + \beta_1 \text{ PROP(STAKE)} + \beta_2 \text{ EXCHANGE} + \beta_3 \text{ LN(AMOUNT)} + \beta_4 \text{ SECURED} + \beta_5 \text{ NEW ISSUE} + \beta_{\text{ind}} \text{ INDUSTRY} + \beta_{\text{rep}} \text{ REPUTATION} + \beta_{\text{mat}} \text{ MATURITY}$$

The dependent variable BPS is the premium of the ex ante yield of a security over the ex ante yield of a treasury of comparable maturity in basis points. The independent variables are PROP(STAKE) is STAKE/AMOUNT, the outstanding lending exposure by the commercial banking affiliate of the bank underwriter (Section 20 subsidiary) to the issuer at the time of issuance of the debt issue as a proportion of the issue size. EXCHANGE is a dummy variable which is 1 if the firm is listed on an exchange. LN(AMOUNT) is the natural logarithm of the offered dollar amount of the issue (in millions of dollars). SECURED is a dummy variable which is 1 if the issue is secured. NEW ISSUE is a dummy variable which is 1 if the issue is a first-time issue. INDUSTRY is a set of industry dummy variables constructed based on one-digit SIC codes. REPUTATION stands for three dummy variables based on market share rank of dollar volume of underwritings of debt issues in our sample. We consider the issues underwritten by the top 20 underwriters in this study. LOWREP is 1 if the rank based on market share is between 16 and 20. MEDREP is 1 if the rank is between 11 and 15. HIREP is 1 if the rank is between 1 and 10. MATURITY stands for three dummy variables based on maturity of the security. LOWMAT is 1 if the issue matures in less than 5 years, MEDMAT is 1 for 5 to 15 years, and HIMAT is 1 if the maturity is greater than 15 years. All dummy variables are 0 otherwise. The point estimates and T ratios for the industry dummys are not reported though they are included in the regressions. The asterisk (*) indicates that none of the issues are of low maturity. a, b, and c stand for significant at 0.01, 0.025, and 0.05 level using a two-tailed test.

These results are consistent with an implicit breach of firewalls in which bank underwritings have a net certification effect for investors.[13] Alternatively, it could be argued that this result comes from investment bank underwriters serving different markets from commercial bank underwriters, with prices reflecting different degrees of market power. If this alternate explanation holds then it should be the case

[13] The bank could also use information acquired from loan monitoring to help firms that are solvent but seemingly in financial distress. Insofar as this is also an outcome of the bank's private information of the true value of the firm, it can be broadly classified as a net certification effect of the bank.

that we would find a reduction in yield spreads for all bank underwritings, rather than the source of the reduction being the bank's lending relationship with the issuer. To test this alternative explanation we replaced the LN(STAKE) variable with a BANK dummy variable, which is 1 if the underwriter is a Section 20 subsidiary and 0 otherwise, in our regressions. We find that the coefficient on the BANK dummy for both the Caa-Ba3 issues as well as the Baa1-Aaa issues was not statistically significant. Based on this, we conclude that as far as the reduction in yield spreads due to the net certification effect is concerned, it is the extent of the bank's underlying lending relationship with the borrower (whose magnitude is captured by the volume of outstanding loans) that matters rather than underwriter type. Further, since higher-credit rated borrowers, such as AAA rated borrowers, have more choices than lower-credit rated borrowers, banks should be able to extract more rents from the latter group. In other words, if banks have a monopolistic power, one would expect the bias to be against finding a net certification effect for low quality issuers. Finally, to examine further the question that segmentation in bank underwritings drives pricing differentials we use the selectivity methods described below.

4.3 Selectivity bias adjustments

In the multivariate linear regressions reported in this article, we have by implication assumed that LN(STAKE) is an exogenous variable. However, such an assumption may be problematic for the following reasons: (i) the decision to underwrite a particular debt issue is endogenous, inducing a selection bias, and (ii) the decision to lend and the magnitude of lending is also an endogenous decision which also induces a selection bias. When a selection bias caused by an endogenous independent variable exists, the coefficient estimators in a linear regression model with the endogenous variable [such as LN(STAKE)] may be inconsistent [see Maddala (1983)]. In other words, the bank's decision to underwrite and its decision to lend (through its commercial banking affiliate) are endogenous and are based on some information set that it has. However, the market cannot observe the information set that the bank has, but can only partially extract such information.

Our results are robust to a two-step selectivity adjustment (see Appendix A.2 for details). The results using this selectivity adjustment for debt issues segmented by credit rating category (see Table 5) are reported in Table 9. In other words, we find that conditioning for the apparent selection bias in LN(STAKE), our results are qualitatively unchanged.

Table 9
Selectivity bias adjustments — bank versus investment house underwritings of debt issues segmented by credit rating category

	Caa-Ba3		Baa1-Aaa	
Variable	Coeff	T ratio	Coeff	T ratio
INTERCEPT	590.71	5.36[a]	56.32	4.41[a]
RESIDUAL	−27.12	−2.91[a]	0.65	0.29
EXCHANGE	−63.88	−3.73[a]	−17.99	−2.95[a]
LN(AMOUNT)	−32.50	−2.34[b]	−1.17	−0.53
REF BK DEBT	32.45	2.09[c]	13.23	3.64[a]
SECURED	28.11	1.60	15.41	2.32[b]
NEW ISSUE	28.61	1.68	14.62	3.19[a]
LOWREP	−41.85	−0.91	−20.54	−1.38
HIREP	−46.32	−2.09[c]	0.09	0.01
LOWMAT	*	*	−21.67	−4.07[a]
HIMAT	−98.92	−1.11	18.60	4.92[a]
Observations	255		415	
Adjusted R^2	0.2096		0.2689	

This table gives the OLS estimates of the following equation:

$$\begin{aligned}\text{BPS} = {} & \beta_0 + \beta_1 \text{ RESIDUAL} + \beta_2 \text{ EXCHANGE} + \beta_3 \text{ LN(AMOUNT)} + \beta_4 \text{ REF BK DEBT} \\ & + \beta_5 \text{ SECURED} + \beta_6 \text{ NEW ISSUE} + \beta_{\text{ind}} \text{ INDUSTRY} + \beta_{\text{rep}} \text{ REPUTATION} \\ & + \beta_{\text{mat}} \text{ MATURITY}\end{aligned}$$

The dependent variable BPS is the premium of the ex ante yield of a security over the ex ante yield of a treasury of comparable maturity in basis points. The independent variables are RESIDUAL is the residuals from the first pass regression of LN(STAKE) on a set of explanatory variables (see Appendix A.2 for details) — where LN(STAKE) is the natural log of 1 plus STAKE, the outstanding lending exposure by the commercial banking affiliate of the bank underwriter (Section 20 subsidiary) to the issuer at the time of issuance of the debt issue. EXCHANGE is a dummy variable which is 1 if the firm is listed on an exchange. LN(AMOUNT) is the natural logarithm of the offered dollar amount of the issue (in millions of dollars). SECURED is a dummy variable which is 1 if the issue is secured. NEW ISSUE is a dummy variable which is 1 if the issue is a first-time issue. INDUSTRY is a set of industry dummy variables constructed based on one-digit SIC codes. REPUTATION stands for three dummy variables based on market share rank of dollar volume of underwritings of debt issues in our sample. We consider the issues underwritten by the top 20 underwriters in this study. LOWREP is 1 if the rank based on market share is between 16 and 20. MEDREP is 1 if the rank is between 11 and 15. HIREP is 1 if the rank is between 1 and 10. MATURITY stands for three dummy variables based on maturity of the security. LOWMAT is 1 if the issue matures in less than 5 years, MEDMAT is 1 for 5 to 15 years, and HIMAT is 1 if the maturity is greater than 15 years. All dummy variables are 0 otherwise. The point estimates and T ratios for the industry dummys are not reported though they are included in the regressions. The asterisk (*) indicates that none of the issues are of low maturity. a, b, and c stand for significant at 0.01, 0.025, and 0.05 level using a two-tailed test.

5. Conclusions

This article examines recent evidence on the characteristics and pricing of debt securities of firms underwritten by two types of financial intermediaries: Section 20 subsidiaries of bank holding companies and investment houses. We find bank underwriting of lower-credit rated issues, where the bank retains a significant stake (through its commercial banking affiliate), results in lower yields (higher prices) consistent with a net certification role of banks through their lending activities.

Interestingly, even in circumstances where a potential conflict of interest is high, that is, where the stated purpose of an issue is to refinance existing bank debt and the bank has a lending stake (through its commercial banking affiliate), we find no evidence of conflict of interest since there is no significant difference between yield spreads on similar debt issues underwritten by banks and investment houses.

The results are consistent with the view that when banks lend to firms (through their commercial banking affiliate) there is a dominant net certification effect present — especially for lower-credit rated issues. These results are obtained in the presence of firewalls and suggest an implicit breach of the firewalls. While we cannot directly extend these results to suggest what would happen in the absence of firewalls in today's market, previous research on similar issues in the pre-Glass–Steagall period by Puri (1996a) also suggests a net certification effect by banks. Together these results suggest that banks have a net certification effect on yield spreads of debt issuers as compared to investment houses that is largely independent of the organizational form within which the bank undertakes such underwritings (i.e., whether there are firewalls, as in the post-Section 20 era, or there are no firewalls, as in the pre-Glass–Steagall period).

We also find that banks bring a relatively larger proportion of smaller-size issues to the market. Over time, as banks have gained underwriting experience, this trend toward underwriting smaller issues, both in absolute terms, and as compared to issue sizes underwritten by investment houses has been increasing. This evidence is contrary to the contention that greater universal banking powers, and larger-size banks, will stunt capital market access for smaller firms.

Our article investigates bank corporate debt underwriting in the first few years (1993–1995) of their having received permission to pursue such activity. The results raise a number of interesting issues. Will the trend toward banks underwriting smaller issues persist in the future? If banks other than money center banks enter the underwriting arena in any scale, would we see differences between the underwriting behavior of different kinds of banks, for example, money center banks and superregionals? What is the long-term default performance of bank underwritten issues? Now that some of the firewalls are being eliminated, what will the impact on future bank underwritings be? We leave these questions to future research when a longer time series of bank underwriting performance will be available.

Appendix

A.1 Description of the data

The sample consists of fixed-rate U.S. nonconvertible debt issues of nonfinancial, nonregulated firms underwritten by the top 20 underwriters. The ranking of the underwriters is based on the total dollar volume of such underwritings during the sample period — January 1, 1993–March 31, 1995. The sample consists of 670 debt issues for which all the required data was available, for example, no missing price information, no missing information on yield of comparable treasury, etc. In this study we exclude all the financial firms (one-digit SIC code 6) since the nature of conflicts of interest is significantly different from those associated with lending to nonfinancial firms. We also exclude all firms in regulated industries (one-digit SIC code 4) since the absence of regulation contrasts the firms in the nonregulated industries from those in the regulated industries. The construction of the dependent and independent variables from the relevant SDC data variable(s) and from Dealscan is explained below. The value of dummy variables is 0 otherwise.

BPS: Same as SDC variable BPS.

LN(STAKE): The natural log of 1 plus STAKE. We need to add 1 to the variable STAKE since the natural log of 0 (the value STAKE takes for all investment house underwritings) is not defined. STAKE is the outstanding lending exposure to the issuer (in millions of dollars) by the commercial banking affiliate of the Section 20 subsidiary. By definition, STAKE is 0 for investment house underwritings (since they have no lending relationship). For all bank underwritings, the issuer name from SDC data is matched with the issuer name in Dealscan. If there is no match then STAKE is 0 and LN(STAKE) is 0 also. If there is a match, we extract all facilities where the commercial banking affiliate of the Section 20 subsidiary which underwrote the debt issue is the lender. STAKE is then obtained by aggregating the dollar value of only those loans by the commercial banking affiliate of the Section 20 underwriter that are outstanding at the time of debt issue. In case a loan is offered by multiple lenders where each of them lend a fraction of the total loan, the dollar value is obtained by multiplying the fraction of the loan and the total value of the loan. Where information on the fraction of the loan is not available, we assume it to be 0. Such an assumption is conservative as it biases against finding any net certification effect.

EXCHANGE: A dummy variable that takes the value 1 if the firm is listed on an exchange and 0 otherwise.

LN(AMOUNT): The natural log of the SDC data variable AMT.

REF BK DEBT: 1 if SDC variable UOPCODE has a value 10.

SECURED: Information from SDC variable SECURL is the primary source. We look for the words *collateralized, mortgage, guaranteed, secured* to mean a value of 1 for this dummy variable. Besides we cross-reference the description with Fabozzi and Fabozzi (1995) to infer if a particular issue can be classified as secured. For example, Equipment Trust Certificates are considered as secured. The secondary sources are the SDC variables GTDC and ENH. For example, a C for ENH indicates collateralized credit enhancement and we upgrade such a debt issue to being secured.

NEW ISSUE: The construction of this variable is done in the following manner: We search to see if the company had a similar debt issue in the last 20 years. If yes, it is taken to be a seasoned issue and this dummy variable takes a value of 0. If not, it is assumed to be a first-time issue (debt IPO) and this dummy variable takes a value of 1.

CREDIT RATING: A set of credit rating dummys (Caa-C, B1-B3, Ba1-Ba3, Baa1-Baa3, A1-A3, Aa1-Aa3, Aaa) are constructed from the SDC variable MDY. For example, B1-B3 is 1 if MDY is B1, B2, or B3.

REPUTATION: Three dummy variables based on market share rank of dollar volume (by aggregating the SDC variable AMT) of underwritings of debt issues in our sample. We consider the issues underwritten by top 20 underwriters in this study. LOWREP is 1 if the rank based on market share is between 16 and 20. MEDREP is 1 if the rank is between 11 and 15. HIREP is 1 if the rank is between 1 and 10.

MATURITY: Three dummy variables are constructed based on YTOFM, the maturity of a debt issue. LOWMAT is 1 if YTOFM is less than 5 years. MEDMAT is 1 if YTOFM is between (and including) 5 and 15 years. HIMAT is 1 if YTOFM is greater than 5 years.

INDUSTRY: Ten industry dummy variables constructed based on one-digit primary SIC codes. For example, if the primary SIC code is 861, the one-digit primary SIC code is 8 and the corresponding dummy variable is 1 and all other dummy variables are 0.

A.2 Selectivity bias adjustments

The multivariate linear regression model used in our article is of the following form:

$$BPS_i = X_i'\beta + \gamma\, LN(STAKE)_i + u_i$$

where BPS_i is the ex ante yield premium of the debt issue, i, X_i is the vector of factors considered significant in determining ex ante yield

premium, and $LN(STAKE)_i$ is the natural log of one plus STAKE, the outstanding lending exposure by the commercial banking affiliate of the bank underwriter (Section 20 subsidiary) to the issuer at the time of issuance of the debt issue. Our inferences in this article are based on the significance of γ, the coefficient of LN(STAKE).

It can be easily seen that $LN(STAKE)_i$ is a tobit variable: positive if the bank has an underlying lending relationship through its commercial banking affiliate, and underwrites the debt issue; 0 otherwise. From the general formulation of a tobit variable, we have:

$$LN(STAKE)_i^* = Z_i'\delta + \epsilon_i$$

$$LN(STAKE)_i = \begin{cases} LN(STAKE)_i^* & \text{when } LN(STAKE)_i^* > 0 \\ 0 & \text{when } LN(STAKE)_i^* \leq 0 \end{cases}$$

where $LN(STAKE)_i^*$ is the latent variable which is observed when positive as $LN(STAKE)_i$. The error term ϵ_i is normally distributed with mean 0 and a finite variance, and Z_i is the vector of publicly available factors considered significant in determining $LN(STAKE)_i^*$. Z_i consists of the following variables, described in detail in Appendix A.1, namely, EXCHANGE, LN(AMOUNT), SECURED, NEW ISSUE, REF BK DEBT, MATURITY, and INDUSTRY.

Note that while the above formulation examines the bank underwriting decision, we could reinterpret the above model in terms of the issuers' decision to go to a commercial bank or an investment house to get their securities underwritten. Thus issuers with particular kinds of characteristics take loans (of certain magnitudes) from banks who have underwriting affiliates. The market observes this and updates its expectations of the private information about the firm, which is now in the bank's possession.

In either case, we need to account for the selection bias induced by tobit variable $LN(STAKE)$. To do this we need to estimate the above equation as a tobit regression and then use the residuals in place of the tobit variable in the linear regression.

Greene (1991) suggests that a practical approach to estimating the tobit regression is to reformulate the tobit model as a probit model. This method of estimation is easy to implement and there is no loss in efficiency in finite samples. In other words we recode the dependent variable as 0 for existing zero observations and 1 for the existing nonzero observations and estimate it as a probit model.

Accordingly, we use the following two-stage method: (i) Estimate the probit likelihood function of the recoded probit model. We use the estimates to construct the residuals, $RESIDUAL_i$ for the tobit model using the parameter estimates of the recoded probit model. (ii) We use $RESIDUAL_i$ in place of $LN(STAKE)_i$ in Equation (1) and estimate the

equation with simple OLS.

Inference can now be made on the basis of the coefficient on $RESIDUAL_i$ which accounts for the selection bias in the tobit variable $LN(STAKE)_i$.

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