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Bank monitoring and the pricing of corporate public debt[1]

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Abstract

We examine whether the existence of a bank/firm relationship lowers the cost of public debt financing. Using a sample of *first* public straight debt offers, we test the cross-monitoring effect of bank debt and Diamond's (1991, Journal of Political Economy, 99, 689–721) reputation-building argument. We find that the existence of bank debt lowers the at-issue yield spreads for first public straight bond offers by about 68 basis points, on average. Consistent with Diamond's reputation-building argument, we document that firm reputation is negatively related to the at-issue yield spread for initial public debt offers.

JEL classification: G12; G24; G30; D82

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1. Introduction

In this study we test the hypothesis that cross-monitoring benefits due to bank debt in the firm's capital structure reduce debt-related monitoring costs,

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and hence the yield of the firm's arm's-length debt. Cross-monitoring occurs when observable monitoring by one type of creditor diminishes the duplicative monitoring and bonding costs of other debtholders. Several theoretical models highlight the unique monitoring function of banks (see for example, Campbell and Kracaw, 1980; Diamond, 1984; Ramakrishnan and Thakor, 1984; Fama, 1985).

These studies generally argue that banks have a comparative cost advantage in monitoring loan agreements which helps reduce the moral hazard costs of new debt financing. For example, Fama argues that banks, as insiders, have access to inside information whereas outside (public) debtholders must rely mostly on publicly available information. Because they have superior information, banks can provide more efficient monitoring which lowers the monitoring and bonding costs of other debt claimants. Diamond (1984, 1991) contends that banks have scale economies and comparative cost advantages in information production that enable them to undertake superior debt-related monitoring. Further, diffused public debt ownership and the associated free-rider problem diminish bondholders' incentives to engage in costly information production and monitoring. This results in higher agency costs relative to bank debt, which is typically concentrated [for related arguments see, Smith and Warner, 1979; Blackwell and Kidwell, 1988; and Diamond, 1984, 1991].

Recent empirical studies provide evidence on the uniqueness of bank loans. These studies examine the issue of whether bank lenders produce valuable information about borrowers. For example, James (1987) and Mikkelson and Partch (1986) document that the announcement of a bank credit agreement conveys positive news to the stock market about the borrowing firm's creditworthiness. Extending James' work, Lummer and McConnell (1989) show that only firms renewing a bank credit agreement have a significantly positive announcement period stock excess return. Shockley and Thakor (1992) document a similarly positive stock price response for loan commitments. Finally, for Japanese firms, Hoshi et al. (1991) find that close banking relationships help firms improve their flow of credit.

Booth (1992) contributes to the empirical literature on debt cross-monitoring by examining bank loan spreads for firms with and without public debt. He concludes that the cross-monitoring benefits from public debt reduce the monitoring costs for bank debt. This leads to a lower yield spread for bank loans. He reports that rated public debt commands a lower yield because of the monitoring provided by bond rating agencies. However, Weinstein (1977) provides evidence that monitoring by bond rating agencies is not always done in a timely fashion. Bank cross-monitoring, therefore, may be more valuable to public debtholders than monitoring by bond rating agencies.

Considering the theoretical premise that bank creditors have superior monitoring ability, we expect that the presence of bank debt (which itself is a certification of creditworthiness) should lower the monitoring and bonding

costs associated with public debt capital. In competitive debt markets, the lower agency costs should be reflected through lower at-issue yield spreads for public debt. We examine the magnitude of the cost savings on public debt capital resulting from an existing bank/firm relationship. Specifically, we examine the at-issue yield spreads (over comparable Treasury bond yields) for *first* public straight bond offerings across firms with and without banking relationships.

Diamond's (1991) study motivates our second hypothesis. Diamond theorizes that firms borrow and repay in the private debt market until they establish a good credit history. After establishing a reputation, firms acquire financing from the public debt market. Diamond suggests that reputation is a valuable asset, and that firms that build reputation through bank loans reduce their cost of public debt. Our sample of first public debt issues provides an opportunity for a direct empirical test of Diamond's reputation-building argument.

We focus on initial (first) public bond offers for several reasons. First, firms that issue seasoned debt are monitored by public debtholders and may also be monitored by bank creditors. Since there is no co-monitoring by public debtholders at the time of the initial public bond offer, our research design isolates the benefits of bank cross-monitoring on the at-issue yield spread for public debt. Second, because first public debt offers are typically undertaken by relatively young and small firms with limited public track records, there is a greater degree of asymmetric information associated with these firms. Therefore, we expect these firms to benefit the most from bank cross-monitoring. Third, unlike seasoned bond offers, nearly 70% of our sample issues are speculative grade which are more likely to benefit from bank cross-monitoring. Finally, since our sample firms have no preexisting public debt, initial public debt issues provide a framework to directly test Diamond's (1991) reputation-building argument.

Our study documents that bank cross-monitoring lowers the at-issue yield spread for the *first* public straight bond offer by about 68 basis points, on average. This statistically, and economically, significant reduction in yield spread exists even after we control for firm and bond characteristics, and for differences in risk. This result complements prior findings that bank agreements convey good news about the borrowing firm (see James, 1987; Lummer and McConnell, 1989). Supporting Diamond's (1991) conjecture, we show that the length of the bank/firm relationship significantly influences the cost of external debt capital by lowering the at-issue yield spread for new public debt.

The paper is organized as follows: In the next section we describe our sample formation process and data characteristics. Section 3 presents the methodology, the empirical model and a description of the control and test variables used in the analysis. The empirical findings are presented in Section 4. The paper is concluded in Section 5.

2. Sample formation and data description

We obtain a comprehensive sample of all initial (first) public straight debt offers made by U.S. corporations between 1971 and 1994 from the Securities and Exchange Commission's Registered Offerings Statistics (ROS) tape and Securities Data Company. During this period, 233 firms made an initial public straight debt offer. Next, we cross-check the sample with Moody's Manuals to verify that the firms do not have preexisting public straight debt.

We screen our sample as follows: To prevent confounding effects, we eliminate all initial bond offers that are unit offerings (composed of debt and common stock), and firms that do not have all relevant financial data available from the Compustat tapes. We also delete observations from the sample if information necessary to calculate the 'all-in' at-issue yield of the bond, such as the underwriting cost of the bond offer, the coupon interest rate, the maturity date of the offer, and the offer price, are not available. Our final sample comprises 98 initial public offers of straight debt.

Our empirical tests involve comparisons of yields on bonds issued by firms with and without banking relationships. For these tests, we assemble a set of control variables that account for various other differences among issuing firms. We obtain data related to issue characteristics, such as the size of the issue, bond indenture covenants, the bond's rating, and the maturity of the offering from the issue's prospectus, Moody's Manuals, and Standard and Poor's Bond Guide. We identify information on prior bank debt from the long-term debt section in Moody's Manuals. If this information is incomplete in Moody's, we examine the firm's annual reports. We follow Johnson's (1997) method of classifying debt as bank debt only if it is identified as such according to the SEC disclosure regulations. We find that 64 firms have bank debt at the time of the first public debt issue, while the remaining 34 firms have no banking relationship.

Table 1 contains information on firm and bond characteristics for our sample. The data indicate that initial public bond offers are made by relatively small firms. These firms have a \$269.77 million median book value of assets and a median market value of equity of \$147.70 million. Our sample firms are also young, issuing public straight debt about 3.72 years (median) after going public.

Since the sample firms are relatively small and young, we expect information asymmetries to result in adverse-selection problems which can be mitigated by a close borrower-lender relationship. Given the nature of our sample firms, it is also not surprising that only 31.63% of the bonds are investment grade. This contrasts with Mikkelson and Partch's (1986) sample of seasoned bonds, of which 81% are rated investment grade. Moreover, 59.18% of our sample bonds are subordinated: to bank debt, other types of private debt, and any future nonsubordinated issues.

Table 1
Issue characteristics of initial public straight debt offers made by U.S. firms between 1971 and 1994

Banking relationship indicates firms with bank loans at the time of initial public straight debt offer. Relative offer size is defined as the offer size divided by the total assets at year-end preceding the offer. Total assets represent book value of total assets measured at year-end prior to the offer year. Investment grade issues are those issues with a Standard and Poor's BBB rating or better. Subordination status indicates that the sample bond issue is subordinated to bank debt, other types of private debt, and any future nonsubordinated issues. Median values are in parentheses. *p*-values for difference in medians are based on Wilcoxon matched pair sign rank test.

Characteristics	Total sample mean (median)	With banking relationship	Without banking relationship	*p*-value for difference in means (medians)
Sample size	98	64	34	
Offer size ($millions)	81.43 (61.25)	90.88 (75.00)	62.82 (50.00)	(0.07 (0.03)
Relative offer size (%)	43.49 (20.84)	38.12 (20.84)	53.60 (20.07)	0.45 (0.98)
Maturity of the issue (years)	12.48 (10.00)	12.29 (10.00)	12.82 (10.50)	0.49 (0.33)
Total assets ($millions)	954.85 (269.77)	831.57 (288.10)	1186.89 (110.65)	0.27 (0.15)
Market value of common stock ($millions)	580.31 (147.70)	596.09 (202.23)	550.60 (89.94)	0.68 (0.09)
Total debt/total assets (%)	40.11 (38.34)	37.54 (37.56)	44.94 (43.47)	0.11 (0.17)
Time between stock IPO and bond IPO (years)	6.53 (3.72)	7.37 (3.33)	4.93 (4.08)	0.20 (0.80)
Investment grade (%)	31.63	32.81	29.41	0.77
Subordination (%)	59.18	62.50	52.94	0.28

Table 1 also provides firm and issue information for two subsamples: issuing firms with and without bank debt outstanding at the time of the offer. The median asset size of firms with a banking relationship is $288.10 million in comparison to $110.65 million for firms without a banking relationship.

The median market values of equity are $202.23 million and $89.94 million for the two groups, respectively.

For firms with a banking relationship, the median offer size of $75 million is significantly larger than the median offer size of $50 million for firms without a banking relationship. However, the issue size relative to total assets is similar for the two groups (20.84% versus 20.07%). Across the two subsamples, the maturity of the bond, the time between equity IPO and the initial public bond

Table 2
Frequency distribution of bond ratings and bond provisions of first public straight debt offers made by U.S. firms, their median at-issue yield spread, offering firm size, and offer size by bond rating, 1971–1994

Panel A: *Frequency distribution of bond ratings*

S&P bond rating	Number	Percent
AAA	0	0.00
AA	2	2.04
A	16	16.33
BBB	13	13.27
BB	12	12.24
B	41	41.84
Not rated	14	14.28

Panel B: *Frequency distribution of bond provisions and indenture covenants*

Bond provision/covenant	Number	Percent
Call provision	82	83.67
Sinking fund provision	42	43.86
Additional debt covenant	11	11.22
Dividend covenant	40	40.82
Lien covenant	34	34.69
Sale-leaseback covenant	23	23.47
Change in control covenant	15	15.31

Panel C: *Median yield spread in basis points, firm size and issue size by bond rating*

S&P's bond rating	Yield spread	Firm size	Issue size
AA	63	6813.0	175.0
A	82	1663.8	100.0
BBB	129	819.4	100.0
BB	408	404.9	87.5
B	437	101.8	35.0
Not rated	343	48.9	17.5

offer, the percent of bonds rated investment grade, and the percent of subordinated bonds are essentially similar. Therefore, even though there may be differences in firm size, there are no differences in the characteristics of bonds issued by firms with and without a banking relationship.

Panel A of Table 2 reports the frequency distribution of bond ratings. Panel B presents the bond provisions and indenture covenants. Panel C shows the median yield spread, firm size, and offer size by bond rating. These data illustrate that higher quality firms (reflected by their higher bond ratings) have greater total assets and tend to make larger bond offers (in absolute dollar amounts). Except for the unrated category, the yield spread monotonically increases with bond default risk. We note that a steep decline in yield spread occurs for firms rated BBB or higher. For example, BB bonds' median yield spread (408 basis points) is more than three times the magnitude for bonds rated BBB (129 basis points).

3. Influence of bank cross-monitoring and firm reputation on public debt cost

We apply a multivariate regression model, with the at-issue yield spread as the dependent variable, to test the bank cross-monitoring and Diamond's (1991) reputation-building hypotheses. The yield spread is defined as the difference in basis points between the at-issue yield for the initial public debt offer and the yield of a Treasury bond with similar maturity and coupon on the same day. We calculate the bond's yield based on the net proceeds from the offering (net of underwriting and other issuing costs). We correct for heteroskedasticity by using White's (1980) method. We classify the independent variables into control and test variables. The following general multivariate model is used in the analysis:

$$\text{Corporate debt yield spread} = f(\text{debt characteristics, indenture covenants, firm characteristics, firm reputation, bank cross-monitoring}).$$

3.1. Debt characteristics variables

We expect to find that the yield spread for corporate debt is negatively related to the bond's rating. To convert the bond's rating into an ordinal scale, we construct a variable that takes on a value of six when the bond is rated AA, five when the bond is rated A, etc. As the quality of the bond increases, we should see the impact of rating on yield spread to diminish. Since a bond's rating might not be linearly related to the yield spread, we use the natural logarithm of rating, *Rating*, as a control variable in our regression models. Booth (1992) finds that the rating of public bonds significantly affects the yield spread for bank loans.

From the bondholder's perspective, bonds that are callable have prepayment risk. Hence, we expect that callable bonds will have higher yield spreads. We define a dummy variable, *Call provision*, that takes a value of one when the bond is callable, and zero otherwise.

Similarly, subordinated bonds are riskier than senior debt, so the yield spread for subordinated debt should be higher than that for senior debt, ceteris paribus. We control for differences in the yield spread by defining a zero/one indicator variable, *Subordinated*, that denotes the absence or presence of subordination status. We note that since none of our sample bonds are secured, we do not include a security variable in our regression model.

The sinking fund feature of a bond can affect its yield spread in one of two ways. The existence of a sinking fund increases the bondholder's likelihood of receiving the principal amount of the loan. This makes the bond safer for the bondholder and can result in a lower at-issue yield spread. Sinking funds, however, are likely to be attached to riskier bonds (see Myers, 1977; Smith and Warner, 1979). Thus, all else constant, bonds with a sinking fund provision should have higher yield spreads than bonds without such a provision. Because of these opposite predictions, the sign of this coefficient can only be resolved empirically. We define a dummy variable, *Sinking fund*, to which we assign a value of one when the bond issue has a sinking fund provision, and zero otherwise.

We also expect *Relative issue size*, defined as the offer size as a percent of total firm assets, to affect the yield spread. If an increase in leverage makes the bonds riskier, then the larger the relative issue size, the greater is the expected yield spread for the bond offer.

3.2. Indenture covenant variables

Restrictive covenants in debt contracts can control incentive conflicts between stockholders and the holders of risky bonds (Jensen and Meckling, 1976; Smith and Warner, 1979). Some restrictions are typically attached to riskier bonds, while others are associated with high quality issues as Iskandar-Datta and Emery (1994) show. Hence, the inclusion of a restrictive covenant on the yield spread for a newly issued bond is an empirical issue that we address in the analysis.

Put options are sometimes attached to bonds to protect the bondholders from certain event risks, such as a major change in the firm's capital structure. If bondholders value such protection, then issues with put options should have lower yield spreads. On the other hand, cross-sectionally, these covenants may be attached to riskier bonds, in which case the yield spreads for bonds with put options could be higher than those without put options. We control for the influence of put options on the yield spreads for corporate bonds using the binary variable, *Change in control*. To control for the remaining indenture

covenants, we create four additional binary (0,1) variables to denote the absence or presence of dividend restrictions, additional debt restrictions, lien restrictions, and sale and leaseback restrictions.

3.3. Firm characteristics variables

We use firm characteristics as additional control variables. Larger firms are generally considered safer investments because of a larger asset base (collateral), higher likelihood of diversified assets, and greater proportion of tangible assets. Hence, we expect to find that firm size is negatively related to the yield spread for corporate bonds. Since size need not be linearly related to the yield spread, following Flannery and Sorescu (1996), we use the natural logarithm of total assets as our *Firm size* variable. Flannery and Sorescu document a negative relation between the natural logarithm of total assets and the yield spread for subordinated notes and debentures issued by banks.

With increased leverage, we expect the default risk and stockholder–bondholder agency costs to rise. This leads to higher debt monitoring costs. Hence, we expect leverage prior to the bond offer to be positively related to the yield spread for corporate bonds.[2] We define *Leverage* as the book value of total debt to firm value (defined as the sum of the book value of debt and the market value of equity) at fiscal year-end prior to the bond offer. We also include a dummy variable, *Industry*, that takes a value of one if the offer is made by a financial firm and zero otherwise.

3.4. Test variables

We define a binary variable, *Banking relation*, that takes a value of one when the firm has a banking relationship during the fiscal year prior to the first public straight bond offer, and zero otherwise. After controlling for firm and bond issue characteristics, if the existence of bank debt provides cross-monitoring benefits to suppliers of external debt capital, then we expect the coefficient of this variable to be negative.

Second, we test Diamond's (1991) contention that firms' reputation building reduces the costs of external borrowing. As Diamond suggests, we use the age of the firm as a proxy for reputation. We define age as the time between the equity IPO and the first public straight bond offer.

The age of the firm is also used to capture the degree of the firm's information asymmetry. It is argued that the greater the age of the firm, the lower the degree

[2] Current liabilities comprise approximately three-quarters of the pre-issue leverage. The remaining portion is composed of one or more of the following items: lease obligations, notes payable, privately placed debentures, receivable facilities, and bank debt (for those with a banking relationship).

of informational asymmetry associated with the firm, and hence, the lower the need for monitoring. Both of these arguments predict a negative relation between firm age and yield spread for the first public debt offer. Since we do not expect the chronological firm age (reputation) to be linearly related to the cost of public debt capital, we use the natural logarithm of (one plus firm age), *Age*, as our proxy for reputation.

We also reason that if the firm has a banking relationship, the *Age* variable can also serve as a proxy for the strength of that relationship. Diamond (1991) suggests that it is not the bank relationship per se, but the strength of the relationship that should affect the cost of outside capital. To capture this effect, we include a cross-product term, *Age x Banking relation*, in two regression models. Based on Diamond's contention that older firms with banking relationships should enjoy lower cost of arm's-length debt, we expect the coefficient of this interaction term to be negative.

4. Empirical findings

We report the results of the multivariate regression analysis in Table 3. First, we control for collinearity among the explanatory variables. Since *Leverage*, *Firm size*, *Industry*, *Relative issue size*, *Call provision*, and the test variables are found to influence bondrating, we first regress the bond rating on the control and test variables in each regression model. The residual from this regression must be orthogonal to each of the right hand side variables, and can be interpreted as the component of rating not accounted for by the other control and test variables. We use this orthogonalized transformation of rating, *Rating*, in each of the regressions. We also construct orthogonalized transformations of *Leverage*, *Firm size*, and *Relative issue size*, and use these in the subsequent analyses. Since we match our sample of corporate bonds with a Treasury bond of similar coupon and maturity, the yield spread is effectively purged of any maturity effects. Therefore, we do not incorporate maturity of the bond as an independent variable.

We find that the coefficients of *Rating* are significantly negative in all five regressions, indicating that default risk has a significant impact on the at-issue yield spread for arm's-length debt. The other proxy for default risk, *Leverage*, is also consistently significant and positive, indicating that higher leverage prior to the bond offer raises the at-issue yield spread for the first public straight bond offer.[3] This result supports Flannery and Sorescu (1996), who find that leverage is positively related to yield spreads on debt offers made by banks.

[3] In other versions of this regression model, we include the square of the residual from the market model to capture the riskiness of the firm. The coefficients of this variable in the various models are not statistically significant. In Booth's (1992) study, his volatility measure is also insignificant.

Table 3
Ordinary least squares regressions explaining the at-issue yield spread for initial public straight debt offers made during the period, 1971–1994

The dependent variable is the at-issue yield spread in basis points of the first public bond offer over that of a corresponding Treasury bond of similar maturity and coupon on the same day. The bond's rating takes a value of 6 when the bond is rated AA, 5 when the bond is rated A, etc. The log of rating is first regressed on the other explanatory variables and the test variables in each model. The residual from this regression, *Rating*, is then used in our analysis. *Leverage* is defined as the book value of total debt relative to the sum of the book value of total debt and the market value of equity. *Firm size* is defined as the log of total assets, while *Relative issue size* is offer size as a percent of total assets. Similar to *Rating*, an orthogonalized transformation of *Leverage*, *Firm size*, and *Relative issue size* is used in the analysis. All bond provisions and indenture covenants (*Sinking fund*, *Call option*, *Subordinated*, *Dividend restriction*, *Debt restriction*, *Lien restriction*, *SL restriction*, and *Change in control*) are zero–one indicator variables taking a value of 1 if the indenture contains such a provision/covenant and 0 otherwise. *Industry* takes on a value of 1 for financial firms and is 0 otherwise. *Age* is the natural logarithm of (1 + the time between the equity IPO and the first public bond offer). *Banking relation* takes on a value of 1 when the firm has a banking relationship during the fiscal year prior to the first bond offer. *p*-values are in parentheses.

Independent variables	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	242.09	217.56	213.14	241.73	230.88
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Rating	− 81.36	− 82.00	− 78.31	− 80.07	− 62.85
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age	− 32.33	—	—	− 22.03	—
	(0.02)			(0.05)	
Banking relation	—	51.76	—	− 84.64	—
		(0.05)		(0.00)	
Age × *Banking relation*	—	—	− 20.66	—	− 19.28
			(0.06)		(0.04)
Leverage	127.37	113.71	126.33	160.98	106.35
	(0.03)	(0.08)	(0.03)	(0.02)	(0.04)
Firm size	− 11.94	− 8.90	− 8.09	5.71	− 2.26
	(0.41)	(0.53)	(0.58)	(0.69)	(0.89)
Industry	− 93.12	− 102.59	− 98.04	− 131.56	− 105.51
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Relative issue size	69.38	71.86	81.11	33.49	71.66
	(0.02)	(0.02)	(0.01)	(0.28)	(0.02)
Call provision	192.15	202.63	194.33	87.26	84.51
	(0.00)	(0.00)	(0.00)	(0.03)	(0.02)
Subordinated	—	—	—	153.36	114.64
				(0.00)	(0.03)

Table 3. Continued.

Independent variables	Model 1	Model 2	Model 3	Model 4	Model 5
Sinking fund	—	—	—	− 20.28 (0.58)	− 18.34 (0.64)
Dividend restriction	—	—	—	72.35 (0.04)	29.78 (0.45)
Debt restriction	—	—	—	68.07 (0.19)	51.80 (0.33)
Lien restriction	—	—	—	− 11.46 (0.83)	4.43 (0.93)
SL restriction	—	—	—	− 37.84 (0.51)	− 90.14 (0.12)
Change in control	—	—	—	135.97 (0.00)	100.26 (0.02)
Adj. R^2	0.53	0.54	0.52	0.60	0.56

The coefficient of *Relative issue size* is significant and positive in four of the five regressions. This implies that the larger the relative issue size, the larger the at-issue yield spread. After controlling for *Rating*, *Leverage*, and *Relative issue size*, *Firm size* has no additional explanatory power. The coefficients of *Firm size* are insignificant in all five models. This result is similar to Crabbe's (1991) finding that firm size is not relevant in determining the re-offering yield spread for investment grade bonds. Booth (1992) uses total sales to proxy for firm size because of unavailability of total assets for his sample of firms. He finds that the larger the firm, measured in terms of sales, the lower the yield spread for its bank loans.

As predicted, the presence of a call provision in the indenture results in significantly higher at-issue yield spreads in all five regressions. Based on models 4 and 5, after controlling for firm and debt characteristics and all restrictive covenants, callable bonds show yield spreads that are, on average, 85.89 basis points higher than noncallable bonds.

Models 4 and 5 also indicate that when issued, subordinated bonds have yield spreads that are, on average, 134 basis points higher than senior bonds, ceteris paribus. The coefficients for *Sinking fund* are insignificant in these two models. Similarly, restrictions on dividends, additional debt, sale and leaseback arrangements, and lien restrictions do not have a significant effect on the at-issue yield spreads for first public bond offers. One exception is the *Dividend restriction* in model 4, which is positive and significant.

The coefficients of *Change in control* are significant and positive in models 4 and 5, indicating that put provisions are typically attached to riskier bonds. Initial public debt offers with put provisions carry an additional yield spread of 118.12 basis points, on average. Our results on this variable differ from Crabbe (1991), who finds that investment grade bonds with event-risk covenants have lower yield spreads. This difference in findings could be attributed to the fact that our sample bonds with this covenant are primarily speculative grade (86.67%), whereas Crabbe's sample is composed only of investment grade issues.[4]

Following Booth (1992), we use the earnings-to-price ratio as another control variable in all five models. This variable should capture the proportion of the firm's assets-in-place to investment opportunities. We find that the coefficients of this variable are positive and insignificant in all models (not reported in the table).[5] Booth finds this variable to be significant in only two of the six models in which it is included.

4.1. Bank cross-monitoring and the pricing of initial public straight debt offers

Table 3 shows that the coefficients of *Banking relation* are negative and significant, indicating that bank monitoring reduces the at-issue yield spreads for initial public debt offers. Model 4 indicates that after controlling for firm and debt characteristics and the existence of bond restrictive covenants, bank cross-monitoring significantly reduces the cost of arm's-length debt by 84.64 basis points. This strongly supports the notion that bank cross-monitoring helps lower the agency cost of public debt. This finding also complements the results of Booth (1992), which document that public debt cross-monitoring reduces the yield spread over prime for bank loans by two basis points. Our results also provide empirical support for Campbell and Kracaw (1980), Diamond (1984), and Fama (1985), who argue that financial intermediaries provide valuable cross-monitoring benefits to other borrowers.

4.2. Firm reputation and the pricing of initial public straight debt offers

As predicted, models 1 and 4 in Table 3 indicate that, after controlling for other factors, the greater the firm's reputation, the lower the at-issue yield spread

[4] In another version of the regression model, we include a term premium defined as the yield on 30-year government bond minus the Treasury bill yield to account for differences in the steepness of the yield curve. The coefficient of this variable is statistically insignificant.

[5] The remaining variables maintained their significance and their coefficients have similar magnitude. We obtain the earnings-to-price ratio from Compustat tapes and the Wall Street Journal. The results for these regressions are based on 66 firms only, since this data item is missing for 22 firms and negative for another 10 firms.

for external debt. As suggested by Diamond (1991), we use the *Age* variable here to capture firm reputation. Our result supports Diamond's reputation-building argument. Because we use the natural logarithm of one plus the time lag between the equity IPO and the bond offer, our finding indicates that there is a nonlinear, negative relation between the firm's reputation and the at-issue yield spread. This follows, since relatively young firms with limited track records have the highest potential for adverse-selection and moral hazard problems and, therefore, should gain the most with age. As these firms build their reputation, the marginal benefits derived from firm reputation (*Age*) decreases, resulting in a concave relation between firm reputation and the cost of borrowing. For example, based on results from model 4, an additional year decreases the yield spread by over 15 basis points for a firm that has just gone public, but only 3.4 basis points if the firm is five years old.

4.3. Strength of banking relationship and the pricing of initial public debt offers

We argued earlier that for firms with a banking relationship, the greater the strength of that relationship, the lower the expected yield spread for the initial public debt offer. To capture this effect, we include a cross-product term, *Age x Banking relation*. This time, the *Age* variable is used as a proxy for the strength of the banking relationship. In models 3 and 5 in Table 3, we show that this factor has a significantly negative influence on the cost of initial public debt capital. This is consistent with Diamond's (1991) prediction that the strength of the banking relationship reduces the cost of external debt.

5. Conclusions

Our examination of a sample of initial public bond offers supports the hypothesis that bank debt significantly lowers the monitoring costs of arm's-length debt. This cross-monitoring benefit is reflected in our finding that bank debt lowers the at-issue yield spread for the first public straight bond offer by an average of 68 basis points. This statistically, and economically, significant reduction in public debt borrowing cost exists after controlling for firm and bond characteristics, and differences in risk. Our finding provides empirical support for the notion that banking relationships are valuable in the pricing of corporate public debt, which is based on the contention in the theoretical literature that bank creditors have information superiority and better monitoring ability than public debtholders. Our results also complement prior empirical findings of James (1987) and Lummer and McConnell (1989), that bank agreements convey good news about the borrowing firm.

We also find that firm reputation, proxied by the age of the firm, is negatively related to the at-issue yield spread over matching Treasury debt of similar

maturity and coupon rate. Our finding is consistent with Diamond's (1991) reputation-building argument that firms with reputational capital are able to borrow at lower rates. We also provide evidence that the length of the bank/firm relationship significantly reduces the cost of external debt capital.

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