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Are There Bank Effects in Borrowers' Costs of Funds? Evidence from a Matched Sample of Borrowers and Banks*

We use a matched sample of individual loans, borrowers, and banks to investigate the effect of banks' financial health on the cost of loans, controlling for borrower risk and information costs. Our principal finding is that low-capital banks tend to charge higher loan rates than well-capitalized banks. This effect is primarily associated with firms for which information costs are likely to be important, and, when borrowing from weak banks, these firms tend to hold more cash. The results indicate that many firms face significant costs in switching lenders and thus provide support for the bank lending channel of monetary transmission.

I. Introduction

Empirical researchers in macroeconomics and corporate finance have long been interested in effects of changes in bank loan supply on borrowers' costs of funds and hence on a variety of investment decisions by borrowers (see, e.g., Roosa 1951). This interest has come to the forefront in policy discussions of the credit crunch in the United States in 1991 and the capital crunch for Japanese banks in 1998. To the extent that a borrower faces switching costs in a relationship with an individual bank, bank-specific financial health might affect a bor-

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rower's cost of funds, even when observable characteristics relating to borrower risk are controlled for. And to the extent that certain borrowers face differentially costly external financing from nonbank as opposed to bank lenders, shifts in the ability or willingness of banks to lend can affect these borrowers' cost of funds and investment.

Sources of a special role for banks in the credit allocation process have been widely explored. Indeed, the existence of banklike financial intermediaries is generally explained by informational asymmetries that lead to costly frictions in the allocation of capital (see, e.g., Diamond 1984, 1989, 1991; Ramakrishnan and Thakor 1984). In this line of inquiry, the relative importance of private financing for firms depends on the magnitude of information costs in acquiring external financing.[1] That is, the role for financial intermediaries in financing investment is most pronounced when high information costs create a significant wedge between the costs of internal and external financing (see, e.g., Bernanke 1983; Fama 1985). While there are significant bodies of research on effects of firms' balance sheet positions on firms' investment decisions and on effects of banks' balance sheet positions on banks' lending decisions, empirical work linking bank and borrower variables has been much more limited.

One strand of research offers indirect evidence on the real decisions of bank-dependent borrowers. Using firm-level data for Japan, Hoshi, Kashyap, and Scharfstein (1993) concluded that investment is less sensitive to cash flow for firms that are members of a *keiretsu*. Also using Japanese data, Gibson (1995) found that firm investment is sensitive to the financial health of the firm's main bank, holding constant *Q* and cash flow (as proxies for investment opportunities and costly external financing). Using data on small U.S. firms, Petersen and Rajan (1994) and Berger and Udell (1995) estimated that a close bank relationship increases credit availability for small borrowers. Using data on larger, publicly traded U.S. firms, Houston and James (1995) found that firms that rely on a single bank lender have a much greater sensitivity of investment to cash flow than do firms that have multiple bank relationships or that borrow in public debt markets. They also estimate that firm-level sensitivity of investment to cash flow increases with a firm's reliance on banks for debt financing.

Another body of research has concluded that replacing banking relationships is costly. James (1987) found that, on announcement of a bank loan, firms earn positive abnormal returns.[2] Similar in spirit to this article is that of Slovin,

1. Perhaps less well understood are costs associated with reliance on banks, including regulatory taxes (Fama 1985), information monopoly power (Sharpe 1990; Rajan 1992), and costs of lender control (Diamond 1994).

2. While James (1987) found that all bank loans earn positive abnormal returns, Lummer and McConnell (1989) found that only loan renewals earn positive abnormal returns and that loan initiations do not. However, Slovin, Johnson, and Glascock (1992) showed that differentiating between loan initiations and loan renewals is unnecessary, because both types of loans earn positive abnormal returns (only in the case of small firms, not in the case of large firms). Accordingly, we control for firm size but not for whether the loan is a renewal or an initiation.

Sushka, and Polonchek (1993), who studied the effects of the de facto failure of Continental Illinois Bank and its subsequent rescue by the Federal Deposit Insurance Corporation (FDIC) during 1984 on the share prices of the bank's loan customers. In particular, they concluded that the impending failure led to negative excess returns for firms with a lending relationship with Continental (especially for those lacking a relationship with another bank), while the rescue led to positive excess returns for those firms. We employ a larger sample of banks and firms than do Slovin, Sushka, and Polonchek, and, more important, we control for firm characteristics related to borrower-specific operating risk and scope for moral hazard.

We attempt to bridge the gap in existing research by matching data on the terms of individual loans with information on the borrower and bank lender in the transaction. This matching allows us to investigate whether, holding constant proxies for borrower risk and information costs, bank liquidity or capital affects terms of lending. In particular, we focus on measuring the effects of borrower and bank characteristics on the interest rate charged to the borrower.

Our principal findings are five. First, even after controlling for proxies for borrower risk and information costs, the cost of borrowing from low-capital banks is higher than the cost of borrowing from well-capitalized banks. Second, this cost difference is traceable to borrowers for which information costs and incentive problems are a priori important. Third, estimated "weak-bank" effects remain even after controlling for unobserved heterogeneity in the matching of borrowers and banks. Fourth, weak-bank effects are quantitatively important only for high-information-cost borrowers, consistent with models of switching costs in bank-borrower relationships and with the underpinnings of the bank lending channel of monetary policy. Fifth, when we investigate determinants of cash holdings of borrowing firms, we find that firms facing high information costs hold more cash than other firms, all else being equal, and those firms (and only those firms) have higher cash holdings when they are loan customers of weak banks. These results suggest that declines in banks' financial health can lead to precautionary saving by some firms, a response that may affect their investment spending.

The article is organized as follows. Section II describes the data sets we use to match loan, bank, and borrower characteristics. Our empirical tests are reported in Section III. Section IV concludes and discusses broader implications of our findings.

II. The Data

Our interest in isolating effects of borrower and bank characteristics on the cost of funds for investment creates a high data hurdle. We require information on loans, borrowers, and banks for each transaction. Our basic source of data is a sample of 11,621 loan agreements with principal amounts totaling $1,895 billion (with an average loan size of $164 million), covering about 4,840 business firms in the United States. The data are taken from the 1993 release of the Dealscan database supplied by the Loan Pricing Corporation (LPC) and cover the period from 1987 to 1992.[3] For a given loan, the LPC data record the identity and location of the borrower; the purpose, contract date, type, and amount of the loan;[4] the identities of the lenders (for our purposes, U.S. banks) party to the loan at origination; and price and some nonprice terms. Almost all (97%) of the loans are floating-rate. To obtain more information about borrower characteristics, we matched the firms in LPC with those in the Compustat database. To obtain more information about bank characteristics, we match the banks in LPC (i.e., the lead bank for a given loan) with data from the Reports of Condition and Income (Call Reports) compiled by the FDIC, the Comptroller of the Currency, and the Federal Reserve System.[5]

We use as a measure of the cost of funds the "drawn all-in spread," or AIS, reported by LPC.[6] The AIS is intended to provide a standard measure of the overall cost of the loan, expressed as a spread over the benchmark London interbank offering rate (LIBOR) and taking into account both one-time and recurring fees associated with the loan. The AIS is defined accordingly as the coupon spread, plus any annual fee, plus any up-front fee divided by the maturity of the loan. For loans not based on LIBOR, the LPC converts the coupon spread into LIBOR terms by adding or subtracting a constant differential reflecting the historical averages of the relevant spreads.[7]

Before investigating empirically the effects of borrower and bank characteristics on the cost of funds, we begin by documenting patterns for loan rates (measured by the AIS), loan maturity, bank size, firm leverage, use of col-

3. Other studies using the LPC data for different purposes include Carey (1995*a*, 1995*b*); Beim (1996); and Carey, Post, and Sharpe (1998). In general, the loan agreements in the Dealscan database cover a significant fraction of the dollar value of outstanding consumer and industrial loans (see Carey et al. 1998). According to LPC, the great majority of the data were collected from letters of commitment and credit agreements drawn from filings with the Securities and Exchange Commission. (Registered firms are required to disclose information about any financing in excess of 10% of their total assets and, while not required to do so, often choose to include the complete text of the credit agreement as an attachment to their filing.) Especially in the more recent years of our sample, some data were collected from news reports or through LPC's relationships with major banks.

4. Some of the loan packages, or "deals," incorporated multiple "facilities" originated by the borrower on that date. Our empirical analysis is at the level of the facility because loan packages with more than one lender do not necessarily involve all lenders in all facilities and because the spread depends on facility-specific attributes.

5. We lose observations when LPC does not report the loan spread or whether the loan is secured and when we cannot match the loan transaction data to the Call Report data or Compustat.

6. An "undrawn all-in spread" on undrawn lines of credit is also reported, but we do not use it in the analysis.

7. The differentials used in the AIS reported in the LPC data set are as follows: +205 basis points for the prime rate, −19 basis points for the commercial paper rate, −125 basis points for the Treasury-bill rate, −25 basis points for the federal funds rate, −12 basis points for the bankers' acceptance rate, and −9 basis points for the rate on negotiable certificates of deposit. Carey (1995*a*) found the loan spread, as measured by the AIS, to be comparable to bond spreads, controlling for differences in maturity and collateral. Replacing these constants with time-varying differentials based on year-specific average spreads has a minimal effect on the results.

TABLE 1 Average Loan, Borrower, and Bank Attributes, by Borrower Size

Borrower Sales ($ Million)	Number of Facilities	Loan Maturity (Months)	AIS (Basis Points)	Fraction Secured	Firm Leverage Ratio	Bank Assets ($ Billion)	Bank Capital Ratio (%)
<$20	276	28	312	.97	.35	20.7	5.60
$20–$50	389	34	272	.90	.41	26.3	5.52
$50–$125	641	33	237	.81	.40	26.3	5.43
$125–$500	1,007	38	201	.84	.44	34.7	5.36
$500–$1,000	396	46	191	.81	.45	45.3	5.46
>$1,000	712	45	151	.84	.47	57.3	5.18
All	3,421	38	213	.85	.43	36.2	5.39

NOTE.—Each facility represents a separate loan; a given deal negotiated with a bank may involve one or more distinct facilities. Firm sales and bank asset data are in terms of constant 1992 dollars. Firms' leverage is defined as the ratio of debt to (debt + equity) from Compustat, where debt and equity are measured at book value. The bank capital ratio is defined as the ratio of equity capital to total assets, taken from the Call Reports. Further details on the data set can be found in the text and in the appendix.

lateral, and bank capital-asset ratios across borrower-size groupings (measured by sales). As table 1 shows, smaller borrowers on average pay a higher AIS, obtain shorter-term loans, are more likely to rely on secured financing, and have somewhat lower leverage than larger borrowers. In addition, smaller borrowers tend to be the loan customers of smaller banks; these small banks, in turn, tend to be better capitalized. Through their common dependence on borrower size, therefore, the AIS would appear to be an increasing function of bank capital. Detecting a link between bank financial weakness and terms of lending will therefore require controls for borrower and bank characteristics.

III. Borrower Characteristics, Bank Characteristics, and the Cost of Funds

Absent informational frictions, in a competitive loan market, the loan interest rate charged by a bank to a borrower should reflect the bank's cost of funds and the risk characteristics of the borrower. Changes in borrower risk will affect the risk premium in the loan rate. Bank-specific increases in the cost of funds would not be passed on to loan customers in the absence of informational or competitive frictions; borrowers could simply switch banks. With informational frictions, this simple loan-pricing story changes in three ways. First, borrower information costs and incentive problems may influence the cost of funds to the borrower. Second, to the extent that the bank-borrower relationship reduces information and incentive costs relative to other forms of financing, borrowers face switching costs in changing lenders; hence an idiosyncratic increase in the bank's cost of funds (say, from a decrease in capital or balance sheet liquidity) could increase the cost of funds to borrowers. (Alternatively, a lower capital-asset ratio can impair a bank's ability to extract repayment, leading to a lower recovery rate in default and a higher credit-risk premium—as in Diamond and Rajan [1999]—though switching costs remain important.) Third, in the presence of information and incentive costs, the loan contract may involve non-price-clearing mechanisms—for example, denial or rationing of credit to certain borrower groups. In this case, the true shadow cost of funds to borrowers could be affected by changes in bank financial health even if the loan interest rate is not affected; we return to this issue of quantity effects in Section IIIC below.

A. How Can One Measure Bank Effects?

Our empirical tests for the role of bank and borrower characteristics in explaining the cost of funds take the form

$$\mathrm{AIS}_{ij\ell t} = \alpha_i + \beta_j + \kappa_t + \gamma X_{ij\ell} + \lambda R_{it} + \omega I_{it} + \delta B_{jt} + \epsilon_{ij\ell t}, \qquad (1)$$

where i, j, ℓ, and t index, respectively, the borrower, bank, loan, and time.[8] The X represents nonprice loan characteristics; R represents proxies for borrower risk; I represents proxies for borrower information costs and incentive problems; B represents bank characteristics; κ denotes year dummies to capture aggregate time variation in lending terms; and ϵ is an error term, which is assumed to be uncorrelated with R, I, and X. In some specifications, we allow for fixed borrower effects (α_i) or bank effects (β_j) to address the possibility that unobserved heterogeneity may introduce a nonzero correlation between the error term and the right-hand-side variables and affect the ordinary least squares (OLS) parameter estimates.

Problems of unobserved borrower heterogeneity in estimating equation (1) arise in at least two ways. First, the interpretation of $\hat{\gamma}$ may be complicated to the extent that the incidence of nonprice provisions (i.e., loan maturity or use of collateral) is correlated with unobserved borrower characteristics: banks may require lower levels of collateral or allow longer loan maturity for better borrowers, for example. Second, the interpretation of $\hat{\delta}$ is made difficult by the possible sorting of borrowers among banks according to private (or, at least, unmeasured) information. To the extent that firms with high (and unobserved) credit risk tend to borrow from weak banks, the estimated $\hat{\delta}$ would be biased upward.

Eliminating the unobserved borrower heterogeneity problem would require an experiment in which borrowers were randomly assigned to banks, thereby isolating the effects of exogenous variation in banks' balance sheets. In the absence of such an ideal experiment, one approach is to study a "natural experiment" involving an exogenous shock to banks' health, as in Peek and Rosengren (1992, 2000). Our approach is to control for firm characteristics as fully as possible or, as in Section IIIB below, to eliminate any borrower heterogeneity through fixed-effects estimation.

For nonprice loan characteristics (X), we include maturity, facility size, a dummy variable equaling unity if the loan rate is based on the bank prime rate (and zero, otherwise), whether the loan was part of a revolving credit

8. One can think of eq. (1) as a reduced form of a loan demand and a loan supply equation, where R, I, and B represent exogenous shifters.

line (of less than or greater than a year's duration, as defined by LPC), and loan purpose. Initially, we focus only on secured loans; we return to the choice of secured status later. We combine the 16 stated loan purposes categorized in the LPC data into five groups (see table A2 in the appendix), each represented by a dummy variable. These groups include general purposes (e.g., for working capital), recapitalization (e.g., for debt consolidation or repayment or specific recapitalization), acquisition (e.g., for general or specific acquisition programs), leveraged buyout (LBO), and miscellaneous (e.g., for trade finance, real estate loans, project finance, commercial paper backup, stock buyback, or securities purchase).[9]

We group borrower characteristics into two types, associated with observable proxies for risk (*R*) and information and incentive costs (*I*). In the former group, we include book-value measures of leverage (i.e., debt/assets) and the current ratio (i.e., current assets/current liabilities), the firm's bond rating, and one-digit standard industrial classification (SIC) industry dummies. Our main proxy for information or control problems is the ratio of property, plant, and equipment (PP&E) to total assets, measured at book value.[10]

Our observed bank characteristics (*B*) include size (log of lender assets), the percentage of loans past due, the capital-to-assets ratio, a "low capital" dummy variable equaling unity if bank equity is less than 5.5% of assets, the net loan charge-off percentage, and bank liquidity (as measured by the ratio of cash and securities to total assets; cf. Kashyap and Stein [1995], [2000]). The threshold for the low-capital dummy was chosen to reflect the uniform 5.5% primary capital requirement imposed in 1985; alternative specifications are explored below.[11] As a proxy for competition in the loan market, the equation also includes a dummy variable equal to unity if the bank is not located in a Metropolitan Statistical Area (MSA) and a variable equal to the Herfindahl index for the MSA for those banks in MSAs and equal to zero otherwise.

Table 2 presents our basic estimates of equation (1), estimated via OLS on a subsample of secured loans and using borrower and bank data from the year prior to the loan.[12] The key result to emerge from columns A and B is that, even after controlling for borrower characteristics, the positive, statistically

9. These categories are similar to but differ somewhat from those used by Carey et al. (1998), as we describe in the appendix.

10. We also tried the quick ratio and the interest-to-sales ratio as risk measures and Tobin's *Q*, the R&D-to-asset ratio, and sales growth as proxies for information and control problems, but none of these turned out to be statistically or economically significant in the presence of the other included variables.

11. The same threshold has been used elsewhere, e.g., by Lown, Peristiani, and Robinson (1999), in defining "capital constrained" banks.

12. The reason for restricting the sample to secured loans is that very few loans in the LPC data set are reported as unsecured. Similar results are obtained when both secured and unsecured loans are used, although the coefficient on a secured dummy variable is positive, perhaps reflecting its correlation with unobserved borrower characteristics. Berger and Udell (1990) and Carey (1995*b*) report similar results. Using bank data from the quarter prior to the loan also does not materially affect the results.

TABLE 2 Spread as a Function of Loan, Firm, and Bank Attributes

	(A)	(B)	(C)	(D)
Intercept	195.52*	235.36*	326.90*	117.60
Maturity	−5.23*	−4.71*	2.44	−4.72*
Log of facility size	2.11	2.75	−5.28	2.51
Purpose:				
Recapitalization	18.38*	18.87*	16.05+	17.47*
Acquisition	14.98+	14.37+	15.56	14.60+
LBO	92.89*	92.15*	98.60*	91.84*
Miscellaneous	−18.40	−19.06	−12.17	−20.00
Type:				
Revolver < 1 year	47.01*	48.17*		48.90*
Revolver ≥ 1 year	−22.32*	−21.59*		−21.44*
Bridge loan	121.81*	125.10*		125.48*
Prime rate dummy	152.41*	153.94*	145.22*	155.00*
Log of market capitalization	−8.04*	−8.06*	−7.07*	−8.25*
Leverage ratio	13.54	10.40	35.16*	6.95
Current ratio	−11.38*	−11.64*	−5.36	−12.34*
PP&E-to-asset ratio	−24.06+	−22.44	−33.58*	−23.54+
Bank equity-capital ratio < 5.5%	21.65*	15.65*	16.22*	15.61*
Nonperforming loans (% of assets)	11.07*	10.63*	7.25*	11.01*
Log of bank assets	−2.38	−4.10+	−2.56	−4.07+
Loan loss provision (% of assets)	−5.97	−7.91+	−5.87	−8.54*
Cash and securities (% of assets)	−.07	−.14	−.74*	−.13
Equity capital (% of assets)	4.49			
Bank return on assets	−.20			
Net charge-offs	−3.53			
Herfindahl index	−36.04			
Bank not in MSA	−2.37			
Bond rating:				
A− to A+				134.74*
BBB− to BBB+				109.07
BB− through BB+				150.84*
B+ or below				119.09+
Unrated				122.79+
Number of observations	1,239	1,257	577	1,257
Adjusted R^2	.5343	.5390	.5378	.5414

NOTE.—Regressions A and B differ only in the set of bank variables included. Results in col. C are for revolvers with maturity of at least 1 year; regression D includes firms' debt rating. All regressions also include year and one-digit SIC dummies. The sample consists of secured loans only; firm and bank data are from the year prior to the loan.

+ Significance at the 10% level.

* Significance at the 5% level.

significant coefficient on the low-capital dummy indicates that spreads on loans from weak banks are modestly higher—in the range of 16–22 basis points, depending on the set of bank variables included. Banks with a higher proportion of nonperforming loans also tend to offer less favorable terms. These results are consistent with those of Lown and Peristiani (1996), who found that during the 1990 credit slowdown, large, undercapitalized banks charged higher-than-average rates for consumer lending relative to better-capitalized institutions.[13] They also parallel related findings for Japanese banks by Ito and Sasaki (1998) and Peek and Rosengren (2000), who found that capital-constrained banks tended to cut back on lending activity. Similar results are obtained when the sample is restricted to include only the most common loan type (revolvers greater than 1 year in maturity; see col. C) and when bond ratings are included (col. D).

As striking as these results are, they probably understate the true weak-bank effect on the borrower's cost of funds, because they capture only the effect on the loan interest rate; ideally, one would also want to take into account the effect on the nonprice characteristics relevant to the loan's true shadow cost. In addition, the results may understate the macroeconomic importance of these effects, as the reliance on Compustat data means that small businesses—which would tend to have higher switching costs—are underrepresented in our sample.

Three other features of the results deserve mention. First, the estimated coefficients on the controls for borrower characteristics—leverage, size, PP&E-to-asset ratio, and current ratio—all have the expected sign and, in many cases, are statistically significant. Second, the estimated coefficient on the loan-maturity variable is negative and statistically significant in all of the specifications. This slightly anomalous result may reflect either a correlation between unobserved borrower characteristics and maturity (banks are willing to make longer-maturity loans to better borrowers) or the presence of fixed up-front costs.[14] Third, all else being equal, loans whose rates are based on the prime rate have significantly higher all-in spreads than nonprime loans.[15]

We further probe the relationship between bank capital and the cost of funds in table 3, by examining whether loan, borrower, and bank effects vary by year or by bank capital threshold. The first two columns report estimates in which the bank-capital effect is allowed to vary by year. The effect of weak banks (as measured by a capital-asset ratio less than 5.5%) is principally associated with the period from 1988 to 1991 (except for 1990). This period includes a monetary contraction from 1988 to 1989, with a 300-basis-point increase in short-term interest rates, followed by the onset of a period of sluggish loan growth (see, e.g., Friedman and Kuttner 1993). The data set's short time-series dimension makes it hard to characterize this pattern with

13. Lown and Peristiani were not, however, able to control for differences in borrower characteristics across banks.

14. When we estimate the basic model (eq. [1]) using just the coupon spread, excluding the up-front fee, we find a small, statistically significant positive coefficient on maturity. This indicates that the up-front fee may indeed be responsible for the negative coefficient reported in table 2.

15. Historically, the prime rate was the rate offered to the best business borrowers. In recent years, however, high-quality corporate loans have increasingly been based on other short-term benchmarks, such as LIBOR, leaving the prime rate as the benchmark rate for loans to smaller, relatively unsophisticated firms (Beim 1996). In our data set, the average facility size for prime loans is significantly smaller than that for nonprime loans for all types and purposes of loans, which may help explain the unusually high AIS on prime-based loans.

TABLE 3 **Year and Threshold Effects in the Relationship between Bank Capital and the Spread**

	Year Effects		Threshold Effects		
	(A)	(B)	(C)	(D)	(E)
Intercept	255.93*	365.50*	241.65*	227.02*	234.37*
Maturity	−4.66*	1.97	−4.60*	−4.67*	−4.70*
Log of facility size	2.13	-5.66^{+}	2.57	2.88	2.76
Purpose:					
Recapitalization	18.40*	14.81^{+}	18.66*	18.87*	19.23*
Acquisition	14.80^{+}	12.88	14.75^{+}	15.23^{+}	14.28^{+}
LBO	90.31*	88.79*	91.26*	92.89*	92.37*
Miscellaneous	−19.59	−13.04	−19.48	−19.25	−19.07
Type:					
Revolver < 1 year	49.54*		49.00*	48.58*	48.19*
Revolver ≥ 1 year	−20.24*		−20.29*	−20.75*	−21.49*
Bridge loan	126.22*		126.71*	122.50*	125.07*
Prime rate dummy	153.68*	142.83*	154.41*	154.17*	153.60*
Log of market capitalization	−7.79*	−7.07*	−8.03*	−8.59*	-8.20^{+}
Leverage ratio	10.07	38.02*	10.33	8.96	10.11
Current ratio	−11.78*	−5.00	−11.59	−11.75*	−11.66*
PP&E-to-asset ratio	-23.47^{+}	−33.96*	−22.51	−20.97	−21.15
Nonperforming loans (% of assets)	10.68*	8.90*	11.00*	11.03*	10.19*
Log of bank assets	-4.20^{+}	−4.02	−4.47*	−3.22	-3.89^{+}
Loan loss provision (% of assets)	-8.08^{+}	−7.94	−8.33*	−11.12*	-7.83^{+}
Cash and securities (% of assets)	−.13	−.48	−.08	−.12	−.16
Bank capital:					
< 5.5% × 1987	−7.77	18.33			
< 5.5% × 1988	25.14^{+}	42.15*			
< 5.5% × 1989	26.84^{+}	35.01*			
< 5.5% × 1990	.22	−1.12			
< 5.5% × 1991	31.33^{+}	21.98			
< 5.5% × 1992	−.46	−5.68			
< 4.5%			17.42^{+}		
≥ 4.5% and < 5.0%			13.24		
≥ 5.0% and < 5.5%			17.37*		
Low-capital effect				54.70	16.85*
Logistic location parameter (μ)				3.39	5.24*
Logistic scale parameter (ϕ)				1.38	5.00
Number of observations	1,247	566	1,247	1,258	1,258
Adjusted R^2	.5422	.5418	.5408	.5382	.5381

NOTE.—All regressions also include year and one-digit SIC dummies. Firm and bank data are from the year prior to the loan. All regressions are for secured loans. Column B is for revolvers with a maturity of 1 year or more. Column D reports the unconstrained logistic specification; in col. E, the logistic scale parameter is set equal to 5.0.

$^{+}$ Significant at the 10% level.

* Significant at the 5% level.

any degree of certainty, but it is worth noting that the pronounced effect of the low-capital dummy during the monetary contraction is consistent with Van den Heuvel's (2000) model of the "bank capital channel" of monetary transmission.

The remaining three columns of table 3 examine potential nonlinearities in the effect of bank capital on spreads. When we divide the bank-capital variable into three ranges (less than 4.5%, between 4.5% and 5.0%, and between 5.0% and 5.5%), the estimated coefficients, reported in column C, suggest that the magnitude of the bank-capital effect does not depend on the degree of the deficiency (though the standard errors are large).

As an alternative way to capture possible nonlinearities, we used nonlinear least squares to estimate a version of equation (1) in which the capital-asset ratio, k, enters through a logistic function,

$$g(k;\ \phi, \mu) = \frac{e^{\phi(\mu - k)}}{1 + e^{\phi(\mu - k)}},$$

which is defined so that as $k \to -\infty$, $g(k) \to 1$, and so that as $k \to \infty$, $g(k) \to 0$. In column D of table 3, we report estimates of the logistic location parameter (μ), the scale parameter (ϕ), and a coefficient on $g(k)$ using nonlinear least squares. In principle, such a specification allows the data to determine both the threshold below which banks start charging higher spreads and the speed with which the effect materializes. The estimates of μ and ϕ are 3.4 and 1.4, respectively, and the estimated coefficient on the g function is about 55, implying an effect of 27.5 basis points when the capital-asset ratio is 3.4%. The estimated value of ϕ of 1.4 implies a relatively gradual transition for g from zero to unity. All three parameters are imprecisely estimated, however, giving further support to the idea that the data are relatively uninformative about nonlinearities in the relationship between the spread and the bank's capital-asset ratio.

Finally, the results in column E of table 3 correspond to the case in which the constraint that $\phi = 5$ is imposed, implying a relatively sharp transition for g from zero to unity. The estimated location parameter for μ is 5.24 (with a standard error of 0.39), which is close to the value of 5.5 we used in the dummy variable specification.

If switching costs for information-intensive borrowers explain the link between bank balance sheets and interest rates on loans, then one would expect the relationship to be strong only for relatively weak borrowers. To investigate this prediction, we split the sample into groups of borrowers based on three classification schemes designed to identify high-information-cost borrowers by (1) whether the firm has a bond rating (following Gilchrist and Himmelberg 1995, 1998); (2) whether the firm is small or large (following Gertler and Gilchrist 1994), where small firms are those in the bottom third of the sample ranked by sales or by market capitalization; or (3) whether the borrower is "prime-dependent," that is, whether the loan is priced using the prime rate.

TABLE 4 Relationship among Switching-Cost Proxies

	Share That Is:				
Subsample	Not Rated	Low Sales	Low Market Capitalization	Prime-Dependent	N
No bond rating	1.00	.42	.41	.33	1,172
Bond rating	.00	.03	.06	.14	344
Low sales	.98	1.00	.69	.52	498
High sales	.67	.00	.16	.17	1,018
Low market cap	.96	.68	1.00	.54	500
High market cap	.68	.16	.00	.16	1,016
Prime-dependent	.89	.60	.63	1.00	431
Not prime-dependent	.73	.22	.21	.00	1,085

NOTE.—Low sales and market capitalization correspond to the bottom third of the sample: $62.26 million for sales and $34.91 million for market capitalization. Prime-dependent firms are those with all loans priced relative to the prime rate.

As table 4 shows, these alternative switching-cost proxies are related. Unrated borrowers are much more likely than rated borrowers to be small or prime-dependent. Small borrowers are much more likely than large borrowers to be unrated or prime-dependent; we obtain similar results when we categorize borrower size using assets or sales. Prime-dependent borrowers are much more likely than other borrowers to be unrated or small.

We report results for this consideration of differential bank effects in table 5. Weak banks—again, defined as having a capital ratio below 5.5%—are associated with less favorable terms (higher AIS) for unrated borrowers, for small borrowers, and for prime-dependent borrowers and not for the complementary sets of borrowers. These findings support the existence of switching costs in bank financing for certain groups of borrowers.

B. How Important Is Unobserved Borrower Heterogeneity?

One advance in this study is the explicit control for borrower, bank, and loan characteristics. As we described earlier, however, there will still likely be unobserved borrower heterogeneity in our sample. Returning to the analysis of bank effects on borrowers' costs of funds, the question naturally arises as to whether unobserved borrower heterogeneity (α_i in eq. [1]) may explain the attachment of weaker borrowers to weaker banks, thereby biasing upward the estimated importance of bank effects on loan spreads.

To pursue this possibility more rigorously, we need to estimate equation (1) using panel-data techniques to eliminate the firm (or firm-bank) fixed effect. This allows us to examine whether, for a given bank-borrower match, a change in the bank's capital-asset ratio affects the AIS. By controlling for other borrower and loan characteristics at the same time, this "within" test offers a cleaner examination of bank effects in the cost of funds. In practice, such a test poses a significant data hurdle, however. Once we restrict the sample

TABLE 5 **Spread as a Function of Loan, Firm, and Bank Attributes, Sample Split by Switching-Cost Proxies**

	Rated Debt		Sales		Market Capitalization		Prime-Dependent	
	Yes	No	High	Low	High	Low	No	Yes
Intercept	98.58	249.77*	133.84*	447.51*	135.51*	415.00*	135.19*	592.31*
Maturity	−5.31	−4.94*	−2.40	−11.54*	−2.20	−12.01*	−2.06	−13.53*
Log of facility size	−.70	3.20	4.07	4.20	4.10	2.88	5.29+	−4.31
Purpose:								
Recapitalization	53.99*	11.30	20.58*	7.42	22.83*	11.61	20.79*	17.31
Acquisition	16.72	14.59	18.83+	5.88	16.39	17.94	10.25	54.80*
LBO	148.81	76.37*	101.15*	27.12	100.30*	48.48+	94.10*	63.31+
Miscellaneous	−1.49	−28.68+	−11.75	−25.56	−10.10	−32.45	−16.03	−6.59
Type:								
Revolver < 1 year	25.07	49.80*	47.52*	47.42*	46.74*	41.61*	59.41*	30.80
Revolver ≥ 1 year	−22.62	−20.69*	−21.30*	−24.85*	20.71*	−26.70*	−15.86*	−35.78*
Bridge loan	114.24*	123.10*	131.93*	112.24*	128.89*	124.03*	140.85*	112.68*
Prime rate dummy	181.10*	153.01*	151.61*	158.28*	155.77*	146.20*	142.52*	. . .
Log of market capitalization	−10.73*	−7.11*	−11.37*	−1.92	−10.30*	−.10	−10.99*	−1.32
Leverage ratio	−1.42	13.39	7.21	40.68+	.92	39.13	8.25	6.01
Current ratio	−13.81	−11.81*	−8.81*	−11.77*	−11.44*	−10.14*	−6.21+	−21.93*
PP&E-to-asset ratio	−28.55*	−24.36	−13.56	−41.65+	−1.56	−76.36*	10.62	−69.92*
Bank equity-capital ratio < 5.5%	−9.74	17.62*	8.81	24.03*	4.92	29.25*	10.00	39.79*
Nonperforming loans (% of assets)	11.94+	9.21*	9.47*	13.02*	12.56*	8.78+	14.24*	3.49
Log of bank assets	10.55	−5.23*	−.08	−8.84+	.18	−8.42*	−1.64	−7.39+
Loan loss provision (% of assets)	−5.22	−8.34+	−6.74	−14.25+	−9.51+	−10.27	−7.91+	−14.28
Cash and securities (% of assets)	−.98	−.07	.01	−.43	−.04	−.07	−.27	−.03
Number of observations	270	986	824	432	816	440	875	381
Adjusted R^2	.6002	.5242	.5378	.5220	.5472	.4684	.5233	.1881

NOTE.—Regressions use the specification from col. D in table 2, with the sample split according to the given criterion. Low sales and market capitalization correspond to the bottom third of the sample: $62.26 million for sales and $34.91 million for market capitalization. Prime-dependent firms are those with all loans priced relative to the prime rate. All regressions also include year and one-digit SIC dummies. The sample consists of secured loans only; firm and bank data are from the year prior to the loan.

+ Significant at the 10% level.

* Significant at the 5% level.

of those firms borrowing repeatedly from a given bank and we match the loan data to the Call Report data for the banks and Compustat data for the borrowers, only 289 observations remain.

As table 6 shows, the within estimate of the impact of low bank capital on the spread is approximately the same as it was in the full sample (table 2) but is not statistically significant. However, if we split the sample by small versus large borrowers (using the same definitions of these groups as before), or by prime-dependent versus non-prime-dependent borrowers, a clear pattern emerges: bank effects are statistically significant and economically important only for the prime-dependent and small-firm subsamples. Hence, as is the case for the earlier tests, bank effects are present for borrowers that a priori face greater costs of switching lenders.

C. How Important Are Bank Effects?

Results from our matched sample of loans, borrowers, and banks suggest strongly that certain groups of borrowers face a higher cost of funds when their bank is weak. Returning to table 5, the cost differential is estimated to be as high as about 40 basis points; the estimate in table 6 is as high as 124 basis points. The weak-bank differential is related to borrower switching costs, given that we have controlled for other loan, borrower, and bank characteristics. Is the differential large or small? Absolutely, the effect on the real cost of funds is smaller than that generated by an increase in safe real interest rates following a monetary contraction. However, even 50 basis points still represents a nontrivial increase in the cost of funds. In our sample of loan transactions, the average real cost of funds is 5.15%, so that a 50-basis-point premium represents an increase of almost 10%. Given a short-run elasticity of a firm's investment rate with respect to the user cost of capital of -0.7 (see Hassett and Hubbard 1998), this implies an estimated weak-bank effect on borrowers' investment rates of about $0.7 \times 2.5 = 1.75\%$.[16]

This estimated bank effect on borrowers' costs of funds and investment expenditures is a lower bound of the likely impact of switching costs on the cost of funds for two reasons. First, our data present information on only the intensive margin on variation in loan interest rates for borrowers that obtained loans. Customers of weak banks who are denied loans are not observable to us; the true impact of switching costs would pick up this extensive-margin effect as well. To the extent that such borrowers are denied bank credit and have no access to other sources of external funding, investment decisions may be distorted. Hassett and Hubbard (1998) note, based on survey evidence, that, all else being equal, firms citing high costs of obtaining external financing use higher "hurdle rates" for investment projects than do other firms. Gertler and Hubbard (1988) find that investment of smaller firms is excessively sen-

16. This calculation assumes a rate of depreciation of 15%. The user cost of capital (abstracting from tax considerations and changes in the price of capital goods) is the sum of the real cost of funds and the rate of depreciation.

TABLE 6 **Within-Firm Relationship among Spread, Bank, and Firm Attributes**

	Full Sample	Sales		Market Capitalization		Prime-Dependent	
		High	Low	High	Low	No	Yes
Maturity	−5.81*	−.70	−14.82*	−3.33	−12.42*	−3.52	−17.68*
Log of facility size	−2.84	−4.65	2.37	−.52	1.29	−5.88	18.57
Purpose:							
Recapitalization	20.07	−45.10*	23.73	−29.75	−.93	−37.70*	9.63
Acquisition	−3.51	−18.83	13.57	−10.72	−23.40	−7.07	−.27
LBO	63.89	40.46	. . .	62.12	. . .	31.21	. . .
Miscellaneous	−11.29	−19.15	−33.08	−12.93	−57.65	−19.92	−55.71
Type:							
Revolver < 1 year	34.71	49.37	−7.53	64.03^{+}	−95.11^{+}	49.52^{+}	−45.17
Revolver ≥ 1 year	−20.92^{+}	−12.87	−45.28^{+}	−19.53	−35.08^{+}	−16.70	−48.51^{+}
Bridge loan	175.83*	274.02*	74.72	185.98*	. . .	274.99*	68.88
Prime rate dummy	117.32*	145.05*	74.37*	125.53*	117.43*	115.91*	. . .
Log of market capitalization	−30.95*	−23.20^{+}	−43.77*	−24.67*	−17.98	−21.86*	−69.30
Leverage ratio	−30.81	46.94	11.85	−14.11	−114.05	23.92	78.57
Current ratio	−5.11	−1.74	−16.26	−2.08	−29.37	−4.41	18.66
PP&E-to-asset ratio	−74.90	−23.82	−113.11	−57.27	−74.90	−75.09	−126.61
Bank equity capital < 5.5%	19.89	−4.89	67.59*	15.72	68.35*	1.15	124.47*
Nonperforming loans (% of assets)	6.98	6.45	−6.10	7.02	3.48	8.78^{+}	−10.37
Number of observations	289	189	100	212	77	224	65
Number of firms	89	61	28	64	25	71	18
Adjusted R^2	.5465	.6403	.4867	.5640	.5356	.6080	.4119

NOTE.—Standard errors are adjusted to reflect the estimation of firm-specific means. Low sales and market capitalization correspond to the bottom third of the sample: $62.26 million for sales and $34.91 million for market capitalization. Prime-dependent firms are those with all loans priced relative to the prime rate. The regressions also include year dummies. The sample consists of secured loans only; firm and bank data are from the year prior to the loan.

$^{+}$ Significant at the 10% level.

* Significant at the 5% level.

sitive to cash flow during recessions, and Kashyap, Stein, and Lamont (1994) conclude that inventory investment is more sensitive to internal funds during periods of credit tightening. Gilchrist and Himmelberg (1998) document that it is small firms and firms lacking a bond rating—the firms on which our tests focus—that account for failures of neoclassical investment models in favor of models in which investment is influenced by financial frictions.

Second, borrowers may invest in costly financial strategies in the presence of switching costs. In particular, in the absence of easily available bank credit, firms may use cash or financial working capital to smooth fluctuations in internal funds and thereby in the cost of external financing (see, e.g., Fazzari and Petersen 1993; Calomiris, Himmelberg, and Wachtel 1995; Hubbard 1998; and Opler et al. 1999). Such a use of cash generates a deadweight loss. Using data on U.S. firms from Compustat, Opler et al. (1999) found that small firms and low-dividend-payout firms have greater holdings of cash and equivalents relative to total assets, all other things being equal, than larger, high-dividend-payout firms, consistent with a precautionary saving story in the presence of costly external financing.

Following Opler et al. (1999), we examine determinants of firms' cash holdings, measured by the ratio of cash and marketable securities to total assets. As explanatory variables, we include *Q*, the log of firm size, cash flow relative to assets, financial working capital relative to assets, earnings volatility in the firm's two-digit SIC industry, research and development (R&D) expense relative to assets, a dummy variable equaling unity if the firm pays dividends (and zero otherwise), a dummy variable equaling unity if the firm's debt is investment grade (and zero otherwise), and a dummy variable equaling unity if the firm has a commercial paper rating. The results of this exploration are reported in the first column of table 7; year dummies are included but not reported. Consistent with prior results, we find that, all else being equal, firms for which information and monitoring costs are arguably high—for example, small firms,[17] non-dividend-paying firms, high-R&D firms, and firms without a commercial paper program—hold more cash relative to assets. Firms appear to engage in a certain amount of "cash smoothing" to finance fixed investment; all else being equal, high cash flow increases cash holdings, and high current investment is associated with a decline in cash holdings. These results are consistent with the proposition that high-information-cost firms—in our case, the firms most likely to be relatively dependent on bank financing—hold larger stocks of cash reserves to other assets than do other firms.

We now investigate the role of bank health in explaining cash holdings; see the results presented in the remaining columns of table 7. As with our previous results, the "weak-bank" proxy (a capital ratio of less than 5.5%) only marginally affects borrowing firms' cash holdings in the full sample. When we break out groups—small firms, prime-dependent borrowers, and

17. Mulligan (1997), using Compustat data, also found that large firms hold less cash as a percentage of sales than do small ones, but he does not control for bank effects.

TABLE 7 Cash-to-Asset Ratio as a Function of Firm and Lender Attributes

	No Bank Effects, Full Sample	Including Bank Effects				
		Full Sample	Low Market Capitalization Firms	Low-Sales Firms	Prime-Dependent Firms	Firms Not Switching Banks
Intercept	.203*	.201*	.252*	.151*	.175*	.195*
Market-to-book ratio	.011*	.011*	.001	.012*	.011*	.011*
Log assets	−.004*	−.005*	−.015*	.018*	.009*	−.002^{+}
Cash flow to asset ratio	−.040*	−.040*	.006	−.028	−.019	−.061*
Financial working capital to asset ratio	−.207*	−.207*	−.179*	−.245*	−.208*	−.201*
Investment-to-asset ratio	−.211*	−.211*	−.101*	−.200*	−.177*	−.231*
Leverage ratio	−.286*	−.286*	−.318*	−.461*	−.357*	−.310*
Industry cash flow volatility	.283*	.285*	.121	.507*	.301*	.318*
Zero or missing R&D	−.013*	−.013*	−.019^{+}	−.022*	−.014	−.015*
R&D-to-asset ratio	.451*	.449*	.124	.535*	.394*	.410*
Dividend dummy	−.027*	−.027*	.004	−.030*	−.016*	−.031*
Bond rating	.002	.002		.027	.093	−.004
Commercial paper rating	−.046*	−.047*				−.042
Bank equity-capital ratio < 5.5%		.005^{+}	.018*	.012*	.004	.011*
Number of observations	6,938	6,938	1,127	1,393	1,427	4,659
Adjusted R^2	.3534	.3536	.2680	.3781	.3108	.3439

NOTE.—Low sales and market capitalization correspond to the bottom third of the sample: $62.26 million for sales and $34.91 million for market capitalization. Prime-dependent firms are those with all loans priced relative to the prime rate. All regressions also include year and one-digit SIC dummies.

$^{+}$ Significant at the 10% level.

* Significant at the 5% level.

firms that do not switch banks—a different pattern emerges. For these subsamples of bank-dependent borrowers, having a "weak-bank" lender raises cash holdings, all else being equal; this effect is statistically significantly different from zero in three of the four cases. The impact is also economically important. Given a mean cash-to-asset ratio of 0.11, nonswitching customers of weak banks hold cash balances relative to assets about 10% higher than other borrowers, for example. This difference suggests that loan customers of troubled banks respond in part by increasing cash holdings. Such a response may be associated with cutbacks in planned inventory investment or fixed capital investment.

IV. Conclusions and Implications

Using a matched sample of individual loans, borrowers, and banks, we find significant evidence that certain groups of firms—generally, smaller firms or firms with no bond rating—face a higher borrowing cost when their bank has low equity capital. This effect remains after controlling for loan terms, proxies for borrower risk, and proxies for borrower information costs. We also find a significant weak-bank effect on borrowing costs for the same groups of borrowers when we control for unobserved borrower heterogeneity. Finally, we show that, all else being equal, high-information-cost firms hold more cash than other firms and hold still more cash when they are the loan customers of weak banks.

We believe this evidence sheds light on two sets of questions. First, the estimated effects of bank characteristics on borrowing costs are consistent with models of switching costs for borrowers for which banking relationships are most valuable. Small, unrated, and prime-dependent borrowers cannot costlessly substitute among lenders.

Second, our results offer a piece of evidence for the debate over the existence of a bank lending channel for monetary policy.[18] The bank lending channel combines the intuition that some borrowers face high information costs in external financing with the assumption that these borrowers depend on banks for external financing or, at a minimum, face high costs of switching from banks to nonbank lenders to obtain funds. In this channel, banks have cost advantages in gathering and monitoring information about the creditworthiness of certain businesses and the behavior of these bank-dependent borrowers. Hence a change in banks' ability or willingness to lend affects bank-dependent borrowers' ability to finance desired spending.

Convincing evidence for the bank lending channel must show that bank decisions affect the cost of funds for high-information-cost borrowers, after controlling for borrower characteristics. While there is substantial empirical

18. See Bernanke and Gertler (1995) and Hubbard (1995) for reviews of alternative transmission mechanisms of monetary policy and Van den Heuvel (2000) for a model of a bank-capital channel of monetary transmission.

evidence that monetary policy can affect the composition of bank balance sheets (see, e.g., Kashyap and Stein 1995, 2000), the bank lending channel also requires that borrowers face switching costs among banks or between bank and nonbank sources of funds. To the extent that such costs are small or bank health simply reflects the health of bank borrowers, estimated effects of monetary policy on bank balance sheets or of changes in the composition of bank balance sheets on bank lending do not provide conclusive evidence of a bank lending channel for monetary policy. Our evidence is consistent with switching costs for the borrowers stressed by the bank lending channel; our results are also consistent with a link between bank health and borrowers' cash holdings (and possibly investment spending).

While our findings are suggestive, they fall short of a structural analysis of the terms of bank lending and of variation across borrowers in terms of lending. Because of data restrictions, we are unable to examine the dynamics of the bank-firm relationship (in particular, the effect of the length of the relationship on the terms of the loan) and consequences of differences in loan covenants. We view such issues as important avenues for future research. We also view the consequences for lending of shifts in bank balance sheet strength following bank consolidation as an interesting topic for future research.

Appendix

I. Matching Data Sets

We begin with an extract of the LPC Dealscan database, containing data on 11,221 loan facilities originated by U.S. banks from 1986 through 1992. Of these, 2,220 observations had missing loan rate data. An additional 256 observations lacked data on basic characteristics of the loan (e.g., maturity or size), leaving 8,745 facilities.

Using the name of the lead lender in Dealscan, we matched these observations to bank-level Call Report data. Matching was not possible in many cases, either because no matching bank name could be found or because more than one bank with the same name was found. Of the 8,745 facilities with nonmissing loan data, 6,490 were successfully matched with bank data.

Using the borrower name and location reported in Dealscan, we matched the loan data with firm data from Compustat. A total of 4,666 facilities were successfully matched; 4,017 of those were matched with Compustat *and* Call Report data. The Compustat data set contains missing values in many cases, however. Of the loans matched to bank and firm data, 1,098 had missing (or zero) values for sales, market capitalization, or an important category of assets or liabilities, leaving 2,919 facilities with usable data.

An additional problem is that the Dealscan database lacks information on whether the loan is secured for roughly 60% of the observations. Restricting the analysis to observations with nonmissing secured data further reduces the number of observations to 1,574.

TABLE A1 Outlier Definitions

Variable	Cutoff	Number of Observations Lost
AIS	>1,000 basis points	9
Current ratio	>8.408	31
Quick ratio	>5.68	29
Tobin's *Q*	>3.839	32
3-year average sales growth rate	<25.9% or >148.1%	79
Bank capital-asset ratio	<2% or >15%	33
Nonperforming loans	>10%	20
Net charge-offs	>5%	15
Bank return on assets	>20%	3

II. Outliers

We dropped a modest number of observations as outliers, according to the criteria summarized in table A1. The cutoffs for the ratios computed from the Compustat firm-level data, which are bounded from below at zero, correspond to the ninety-ninth percentile of the distribution; the cutoffs for the sales growth rate are the first and ninety-ninth percentiles. For the LPC and Call Report data, we determined cutoffs by inspecting the relevant histograms, which revealed a small number of extreme observations. In each case, these cutoffs are more inclusive—leaving more usable observations—than the first and ninety-ninth percentiles.

Table A1 summarizes the criteria we used for outlier classification. Values of any given variable in excess of the cutoff were replaced with the missing value code. The number of observations lost therefore depends on whether the variable was included in the regression. In the specification in column D of table 2, for example, these criteria resulted in the loss of 89 observations.

III. Deflators

Nominal variables not expressed as a ratio were deflated using the annual average of the gross domestic product (GDP) deflator for the relevant year.

IV. Categorization of Loan Purpose and Type

Loan Pricing Corporation reports 16 distinct loan purposes, which we group into the six categories shown in table A2. Dummy variables are then defined for each category. The "general" dummy is not included in the regression, and the spread corresponding to this purpose is subsumed into the intercept. Loans falling into the "other" category are omitted from the analysis.

Loan Pricing Corporation also reports 11 different loan types. Loan commitments, term loans, notes, and demand loans are not distinguished, and the average spread on these types is subsumed into the intercept. We include dummy variables for revolvers with maturity less than 1 year, revolvers with maturity greater than 1 year (including 364-day facilities), and bridge loans. None of the other three loan types—multioption facilities, standby letters of credit, or acceptances—appears in our sample.

TABLE A2 Loan Purposes and Spreads

Category and Purpose	Number	Percentage Unsecured	AIS	
			Unsecured	Secured
General:				
General corporate purposes	1,306	22	150	273
Working capital	1,168	15	161	278
Recapitalization:				
Recapitalization	177	6	274	276
Debt repayment/ consolidation	1,062	8	244	280
Acquisition:				
General acquisitions	153	15	203	274
Takeover acquisitions	512	9	181	313
LBO	419	7	453	362
Miscellaneous:				
Project finance	45	13	159	214
Real estate	90	16	174	293
Securities purchase	64	9	163	277
Stock buyback	39	21	57	211
Trade finance	20	15	158	265
Other:				
Debtor in possession	46	0		609
Commercial paper backup	33	49	73	88
Credit enhancement	3	33		398
Employee stock ownership plan	42	5		143

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