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Market discipline of bank risk: Evidence from subordinated debt contracts

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Abstract

Do bank debtholders discipline excessive risk taking? I investigate this question by examining how a bank's incentives to take risks affect offering yield spreads and restrictive covenants in their debt contracts. Results suggest that bank charter values, which determine a bank's risk-taking incentives, significantly affect the likelihood of restrictive covenants in bank debt contracts. This effect was most pronounced during the 1980s, when greater competition and relatively less-stringent regulation increased the severity of moral hazard problems in the US banking industry. Overall, the results suggest that an important channel for market investors to discipline bank risk taking is through writing restrictive covenants in bank debt.

JEL classification: G21; G32; G38

Keywords: Bank risk taking; Subordinated debtholders; Market discipline; Debt covenants; Banking regulation

1. Introduction

Recent banking reform proposals advocate the provision of private efforts in monitoring and controlling bank risk as being more effective than direct regulatory oversight. The Basel Committee on Banking Supervision, for example, designates market discipline as

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one of the three pillars of future financial regulation. By appealing to market discipline, several of these proposals require mandated issuance of subordinated debt because such debt provides direct discipline if yields are positively correlated with bank risk measures.[1] Anticipating higher funding costs from increased bank risk, banks have the incentive to prudently manage risk taking.[2] Moreover, subordinated debt provides indirect discipline if the information contained in secondary market prices helps in the supervisory process. A key question is whether or not market investors in subordinated bank debt can and will effectively assess and control the risk-taking incentives of banks.

The existing tests of market discipline, which typically focus on the relation between subordinated debt yields and bank risk, have been inconclusive. Early papers by Avery et al. (1988) and Gorton and Santomero (1990) examine balance sheets and income statements and find no evidence of a relation between yields on bank subordinated debt and risk measures. In contrast, Flannery and Sorescu (1996) and Jagtiani et al. (2002) show that during the late 1980s and early 1990s, as regulators showed greater willingness to allow subordinated debtholders to absorb losses, yields on subordinated debt correlated more closely with accounting risk measures.[3]

Offering yield spreads represents only one part of the contracting process between bank and market investors. Investors also can directly limit a bank's ability to engage in risk-taking by including restrictive covenants in debt contracts (Smith and Warner, 1979). Restrictive covenants and yield spreads are determined jointly. Investors require lower yield spreads on more restrictive debt contracts, all else equal, because the presence of covenants limits the issuer's future risk-taking behavior. A more restrictive contract, however, imposes costs of reduced flexibility on the issuers. The decision to include covenants, therefore, depends on the tradeoff between the expected reduction in yield spreads from offering a more restrictive contract and the costs associated with reduced flexibility. Thus, it is possible that, in a period such as the early 1980s for which previous research has shown that yields were insensitive to risk-taking measures, subordinated debtholders included more covenants in debt contracts issued by riskier banks.[4]

In this paper, I empirically address the following question: how does a bank's incentive to take risks affect both the offering yield spreads and the restrictive covenants in subordinated debt issued by banks? Risk taking incentives of banks depend on the value of their charter, which reflects future economic rents that banks obtain from privileged access to markets protected from competition. Banks with valuable charters have few incentives

[1] These proposals include those by Benston and Kaufman (1994), Wall (1989), Keehn (1989), Cooper and Fraser (1988), Benston et al. (1986), Calomiris (1997), Benink and Calomiris (1999), and Evanoff and Wall (2000). A Federal Reserve task force recently examined whether large banks should be required to issue subordinated debt as a means to enhance supervision (Federal Reserve Board, 1999, 2000). The US Congress has also recently expressed an interest in subordinated debt as a potential regulatory tool (Gramm–Leach–Bliley Act).

[2] However, Bliss and Flannery (2002) point out that showing a positive relation between subordinated debt yields and bank risk does not mean that banks will actually respond to changes in these yields.

[3] See Flannery (1998, 2001) for a survey of studies examining the relation between yield-spreads and risk measures.

[4] An alternative explanation is offered by Covitz et al. (2002) who argue that banks time their debt issuances and consequently secondary market debt prices understate the potential of market discipline in some periods and overstate it in others.

to engage in risk taking, because if they fail, they lose their valuable charters (Keeley, 1990 and Greenbaum and Thakor, 1995). Since bank charter values are measured by the market-to-book ratio (q), banks with low q are likely to have greater incentives to engage in risk taking. If market discipline exists, one would expect that debt contracts issued by banks with low q will offer higher yield spreads and/or more restrictive covenants. Also, if covenants restrict future risk-taking incentives, then including them will reduce yield spreads for those issuers.

These predictions are examined on a sample of 415 debt contracts issued by US bank holding companies during the 1974–1995 period. Bank debt contracts frequently include covenants that restrict investment, dividend, and financing policies. Using an empirical model that accounts for the endogeneity between yield spreads and contract restrictiveness, I examine if the offering yield spreads and the existence of restrictive covenants in debt contracts issued by banks is sensitive to their q ratios.

The results show that restrictive covenants are significantly more likely in debt issued by banks with low q ratios. Banks with greater incentives to take risks also offer higher yield spreads, but this evidence is weak. Importantly, the likelihood of including restrictive covenants is higher when the expected reduction in the yield spread from offering a more restrictive contract is larger. Clearly, subordinated debtholders value restrictive covenants in bank debt contracts—they require lower yields when banks offer more restrictive contracts. Overall, the results are consistent with debtholders engaging in private monitoring of bank risk taking.

The evidence offered here points to the important role that covenants play in mitigating bank risk taking. The results complement previous empirical studies that focus on the role of yield spreads in disciplining bank risk taking. As recent surveys by Flannery (1998, 2001) show, previous studies have largely focused on the relation between yield spreads and bank risk in testing for market discipline. Restrictive covenants in bank debt contracts have not received the same level of attention. By focusing on both yield spreads and restrictive covenants, this study shows that debtholders have alternative channels to influence and monitor bank risk taking.

The findings have several implications of immediate relevance to the current regulatory debate. First, they show that restrictive covenants in bank debt are important disciplining mechanisms. Since the Basel Capital Accord in 1988, bank regulators have been standardizing debt contracts and restricting the ability of banks to include covenants in debt that qualifies as Tier II capital. Because restrictive covenants discipline bank risk taking, regulatory restrictions on including covenants in bank debt should be re-examined. Second, the results support current banking reform proposals mandating banks to issue subordinated debt. Regulators should therefore increase their reliance on subordinated debt as a tool for disciplining excessive risk taking.

Black and Shevlin (1999) also examine covenants in bank debt issues outstanding at year-end 1979 and year-end 1984.[5] These authors show no relation between the market-to-

[5] The focus of Black and Shevlin's (1999) paper is on documenting the decline in the use of covenants in the early 1980s compared with that in 1970s. Several other studies (for example, Malitz, 1994 and Asquith and Wizman, 1990) also find a decline in the existence of covenants in debt issued by industrial firms suggesting that the decline in the use of covenants during the 1980s is not specific to the banking industry.

book ratio and restrictive covenants in outstanding bank debt. Black and Shevlin's results sharply contrast the results offered here, which show a negative relation between the presence of covenants and the beginning-of-period q ratios. The differences are likely due to vastly different samples and the research designs. Black and Shevlin focus on covenants in outstanding debt at two points in time in a bank's history—year-end 1979 and year-end 1984 (regardless of when the debt was actually issued). In contrast, I construct a full panel of *new* fixed-rate straight public debt issues by US bank holding companies over the 1974–1995 period. As a result, I have a much larger sample of new bank debt issues that spans a much longer period, and I can relate the choice of covenants at the time of issue to the beginning-of-period q ratios.

This paper is organized as follows. Section 2 develops testable hypotheses on the relation between a bank's charter values and the structure of its subordinated debt contracts. This section also describes how changes in the competitive and regulatory structure of banking can affect the relation between the bank's charter values and the existence of restrictive covenants in bank debt contracts. Section 3 describes the data and discusses bank charter value measures. Section 4 describes the sample and provides descriptive statistics on the issuers and the characteristics of debt, including the use of covenants. Section 5 describes the empirical model and discusses the results. Section 6 concludes the paper.

2. Charter values and the structure of bank debt contracts

Chartering authorities grant banks privileged access to profitable lending and deposit-gathering opportunities. Market power in deposit and loan markets, efficiency, comparative advantage in production, and valuable lending relationships all generate a stream of economic rents whose present value is reflected in a bank's charter value. A higher charter value lowers a bank's incentive to take risks because "with valuable charters as assets, banks have incentives not to risk failure since the owners of the banks cannot sell the charter once the bank is declared insolvent" (Keeley, 1990). Banks with high charter values lose a lot of their value if risky business strategies lead to insolvency.[6] The empirical implications are straightforward. As banks with low charter values have greater incentives to take risks, investors in the debt securities of these banks will require higher offering yields and/or more restrictive covenants.

However, the relations between bank charter values, yields and the restrictiveness of debt contracts depend on the regulatory constraints on the banks' ability to increase the risk of their assets. If the regulatory framework restricts the feasible options that banks have to change the riskiness of their assets, then private debtholders' incentives to engage in monitoring through structuring bank debt contracts will be weaker.

During the first 50 years of FDIC's history, regulations that restricted entry into banking markets and reduced price competition kept the charter values of banks high, which mitigated banks' risk-taking incentives. But, in the early 1980s, the regulatory environment

[6] Consistent with these arguments, Demsetz et al. (1996) find a negative relation between charter value and bank risk.

and incentives to engage in risk taking changed dramatically. The Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA) phased out Regulation *Q* deposit rate ceilings and permitted banks to offer interest-bearing transaction accounts nationwide. The original motivation of Regulation *Q* was to "prevent destructive" competition and excessive risk taking among banks. Abolishing interest rate ceilings and relaxing service restrictions injected a measure of competition between depository and non-depository institutions. DIDMCA also increased insurance coverage from $40,000 to $100,000 per account, which further increased incentives for risk taking and reduced incentives for monitoring by depositors.

Greenbaum and Thakor (1995) summarize these changes and note that "[t]he deregulation that took place in the 1980s increased banking competition but lowered the value of bank charters. Greater risk taking was predictable." Taken together, less stringent regulations, increased competition, and greater moral hazard during a large part of the 1980s suggests that the structure of subordinated debt contracts is likely to be relatively more sensitive to bank charter values during the 1981–1988 period compared to the earlier period.

In contrast, the Basel Capital Accord in 1988 and the FDIC Improvement Act (FDICIA) in 1991 substantially "re-regulated" the banking industry. FDICIA imposed regulatory discipline through higher capital ratio requirements, prompt corrective regulatory actions, and risk-based deposit insurance premia. Additionally, the law required federal regulators to conduct annual safety and soundness examinations of all insured institutions and mandated adoption of uniform standards for real estate lending by insured depository institutions. If this increase in federal oversight replaced private risk bearing, then one would expect contract restrictiveness to become less sensitive to bank charter values in the 1989–1995 period.

In addition, after the Basel Capital Accord, subordinated debt included in supplementary capital could not be redeemed without prior permission of FDIC or another primary federal regulator. Therefore, banks issuing subordinated debt in the late 1980s and early 1990s are less likely to include covenants that accelerated repayment of the principal. This will further weaken the sensitivity between contract restrictiveness and bank charter value in the period after 1988.

The current debate about the empirical evidence on subordinated debt discipline often hinges on whether subordinated debtholders believed they were protected by the federal regulators' "too big to fail" (TBTF) policy during the early-to-mid 1980s. The extension of the government's conjectural guarantee to subordinate debt weakens the incentives that subordinated debtholders have to monitor bank risk taking. Flannery and Sorescu (1996) find that the correlation between spreads on bank debt and risk measures was weak in the early 1980s and it appears to have increased in the late 1980s and early 1990s as conjectural guarantees weakened in the late 1980s. By contrast, Ellis and Flannery (1992) show that even during 1982–1988, large certificates of deposit (which are relatively more conjecturally insured) contained rational default risk premia. Overall, the empirical evidence on whether subordinated debtholders believed that the federal regulators de facto insured them is mixed. To the extent that a conjectural guarantee to subordinated debtholders exists, the results are biased against finding any evidence of market discipline.

3. Data and sample selection

I review annual issues of Moody's Bank and Finance manual for the period 1974 to 1995 for the largest 150 bank holding companies listed on the Bank Compustat tapes to identify US dollar fixed-rate debt offers.[7] The summaries reported in Moody's provide information on the structure of debt contracts. These terms include the amount and type of security being issued, the coupon rate and maturity date, whether the issue includes a call or a sinking fund provision, and the principal covenants included in the trust indenture agreement.[8] Debt issues with imbedded conversion options or warrants[9] (42 issues) and issues for which Moody's information is incomplete (15 issues) are excluded. The final sample consists of 415 debt offerings completed by 72 bank holding companies. Since several bank holding companies issued multiple debt contracts, Section 5.4 addresses the econometric issues concerning multiple issues in the sample.

The offering yield spreads are estimated as the difference between the offering yield on the sample debt issue and the constant maturity yield on a Treasury security of comparable maturity on the same day. When a Treasury rate with a comparable maturity is not available, a comparable Treasury rate is obtained by interpolating rates on two Treasury securities with maturities bounding that of the new debt issue. Financial data for the year preceding the offering is from the Bank Compustat tapes.

3.1. Measuring bank charter values

The economic rents that result from a valuable charter are capitalized in the market value of the bank's assets (but not in the book value). Therefore, a common proxy for bank charter value is Tobin's q ratio, which is estimated as the ratio of the market value of assets over the book value of assets, where the market value of assets is the market value of equity plus the book values of preferred stock, debt, and deposit obligations.[10] Keeley (1990) argues that q is a useful proxy for market power and presents evidence that changes in regulatory entry barriers are systematically related to the q ratios of banks.

The discussion so far implies that q measures bank charter values and banks with low q ratios have greater risk-taking incentives. Therefore, finding evidence that offering yield spreads and/or the presence of restrictive covenants is negatively related to q would be consistent with subordinated debtholders disciplining bank risk taking. However, there exists a different (and more traditional) view of the market-to-book ratios that they are proxies

[7] The largest 150 bank holding companies on the Compustat tapes held roughly 50 percent of all US bank assets in 1980. According to Avery et al. (1988), the 100 largest US bank holding companies are the only ones with publicly traded subordinated notes and debentures.

[8] Several studies use covenant data from Moody's manuals (see, for example, Black and Shevlin, 1999; Asquith and Wizman, 1990; and Marais et al., 1989). Begley (1990) and Press and Weintrop (1990) compare the covenants reported in Moody's with those in the registration statements filed with the SEC and conclude that Moody's reporting of covenants is generally accurate for public debt contracts.

[9] Convertible bonds are excluded because their pricing is affected by the imbedded conversion option. Although convertible bonds are not examined here, Green (1984) and Jensen and Meckling (1976) argue that they can be an effective means of reducing risk-shifting incentives.

[10] See, for example, Keeley (1990), Demsetz et al. (1996) and Galloway et al. (1997).

for a firm's growth opportunities. Myers (1977) argues that stockholders of firms whose assets consist primarily of growth options have greater incentives to reject projects with positive net present values (the underinvestment problem). In addition, firms with more growth options perhaps have more opportunities to engage in asset substitution (Jensen and Meckling, 1976).

If q measures growth opportunities and if incentive conflicts are more severe in banks with more growth opportunities, as the alternative view suggests, then a positive relation between q and covenants is predicted, for example. Although the empirical evidence on this alternative view is mixed,[11] a direct way to address concerns about the q ratio is to search for a measure of charter value that is unrelated to the bank's growth options.

An alternative proxy for bank charter value is the ratio of demand deposits to total deposits. The demand deposit ratio measures the market power that results from deposit markets. Keeley (1990) argues that the ability to issue deposits at below market rates is an important component of a bank's charter value. Consistent with these arguments, Neumark and Sharpe (1992) show that banks with market power are slow to adjust their deposit rates upward in response to rising open market rates and that these same banks are quick to adjust their deposits rates downward in response to falling market interest rates. Market power allows banks to skim off extra surplus on movements in both directions. Similarly, Hutchison and Pennacchi (1996) show that significant market power can exist in retail deposit markets and that many banks exercise their market power in setting retail deposit rates. These authors show that demand deposits significantly contribute to a bank's charter value. Therefore, additional models that use the demand deposit ratio in place of q are also reported.

4. Sample characteristics

Panel A of Table 1 reports the number of debt offerings and the amount offered (in constant dollars) by bank holding companies during the 1974–1995 period. Both in number of issues and amount, US bank holding companies issued substantially more debt during the 1980s and the 1990s than during the 1970s. The increase in the debt offerings in the 1980s perhaps reflects the more stringent guidelines on capital adequacy in the early 1980s. A significant change in capital regulations occurred following the less-developed-country (LDC) crisis in 1983, which was prompted by the declining condition of US money-center banks and the banking system, the Federal Reserve and the Comptroller of Currency's requirement of minimum capital levels for multinational banks at the same level as for regional banks. Consistent with these regulatory changes, the data show a significant in-

[11] For example, Begley (1994) examines the relation between the existence of covenants and growth opportunities and finds the predicted positive relation between covenants and growth opportunities for senior debt but no relation for subordinated debt issues. In a more recent study, Alderson and Betker (1995) find evidence that is inconsistent with this alternative view. They show that firms with high liquidation costs (i.e., those with high growth opportunities) offer debt with less restrictive covenants. According to them, firms with high liquidation costs choose covenant structures that make default less likely, since assets consisting primarily of growth options will lose more of their value if the firm is in financial distress.

Table 1
Distribution of restrictive covenant categories in bank subordinated debt contracts issued by US bank holding companies, 1974-1995

Panel A. Number and amount of bank debt issued

	1974–1995	1974–1980	1981–1988	1989–1995
Number of debt issues	415	54	201	160
Total amount of debt issued (in millions of 1980 dollars)	43,795	6947	20,171	16,677

Panel B. Distribution of restrictive covenant categories

	1974–1995		1974–1980		1981–1988		1989–1995	
	No.	% of total	No.	% of total	No.	% of total	No.	% of total
Debt contracts with covenants	134	32	51	94	69	34	14	9
Restrictions on investment policy	43	10	23	43	15	8	5	3
Restrictions on debt	109	26	41	76	59	29	9	6
Restrictions on payment of dividends	54	13	21	39	31	15	2	1

Panel C. Comparison of covenants in bank debt with those in industrial debt issues in Malitz (1994)

	Bank debt (% of total) 1974–1992	Industrial debt (% of total) 1970–1992	Bank debt (% of total) 1974–1979	Industrial debt (% of total) 1970–1979	Bank debt (% of total) 1980–1992	Industrial debt (% of total) 1980–1992
Restrictions on investment policy						
Restrictions on mergers	4.3	6.8*	13.2	N/A	3.3	N/A
Restrictions on asset sales	2.7	2.7*	5.3	N/A	2.4	N/A
Restriction on sale of shares of a subsidiary	11.1	N/A	36.8	N/A	8.2	N/A
Restrictions on debt						
Restriction on liens	28.2	94.7	84.2	95.3	21.8	94.2
Restriction on debt issuance	3.5	26.3	7.9	50.7	3.0	5.3
Restrictions on payment of dividends	14.6	28.2	42.1	55.4	11.5	4.7

Notes. The sample comprises 415 fixed-rate, nonconvertible US dollar debt securities issued by 72 US bank holding companies from 1974 to 1995. Information on the existence of restrictive covenants is obtained from Moody's Bank and Finance Manuals. The covenants are classified into three categories: (1) restrictions on investment policies, which include restrictions on mergers, selling shares in a subsidiary, selling assets, put, and other investment policy restrictions; (2) restrictions on debt, which include restrictions on additional debt and those on creation of liens; and (3) restrictions on dividends.

* Indicates that Malitz (1994) reported these numbers for the 1960–1992 period.

crease in debt issues by money-center banks. In Section 5.4, I examine if money-center debt issues in the early 1980s affect the results in this paper.

Panel B presents the distribution of the restrictive covenants in bank debt contracts. Following Smith and Warner (1979), restrictive covenants are classified into three categories: restrictions on investment, restrictions on payment of dividends, and restrictions on financing.

Restriction on investment policy: Covenants restricting the investment policies of banks appear in 43 of the 415 bank debt contracts in this sample. These covenants include restric-

tions on mergers (16 issues), restrictions on the sale of shares in a subsidiary (41 issues), restrictions on asset sales (10 issues), repurchase (or put) provisions (11 issues), and other idiosyncratic provisions that restrict a bank's investment policy (8 issues). Restrictions on mergers sometimes restrict all mergers, but more often permit mergers if some conditions are met. Smith and Warner (1979) argue that merger restrictions prevent asset substitution if the variance rates or capital structures of the target are different from those of the acquirer.

Bank debt contracts frequently include repurchase provisions and restrictions on selling shares in a subsidiary.[12] Flannery (1994) argues that the use of a put provision alleviates banks' incentives to engage in asset substitution. Restricting the sale of shares in a subsidiary and the sale of assets raises the cost to shareholders of substituting variance-increasing assets for those currently owned by the bank. Some bank debt contracts also include restrictions on investing in non-bank assets. Some covenants require that the bank preserve its corporate existence, rights and franchises, and, subject to certain exceptions, those of its subsidiary banks. These covenants are relatively unusual. The results reported in Section 5 are qualitatively identical whether these "other" covenants are included or excluded.

Restrictions on financing policies: Restrictions on financing appear in 109 of the 415 (about 26% of the sample) bank debt contracts in the sample. These restrictions prevent a bank from issuing additional debt and from creating liens on its existing assets. Subordinated bank debt contracts frequently restrict the ability of bank holding companies to encumber existing and future assets for future indebtedness. Typically, limitations on liens are included as negative pledges. These limitations provide that no liens may be created as security for other indebtedness unless the debentures are equally and ratably secured. Exceptions are liens on property to secure loans made to finance the purchase or improvement of such property as well as liens on property existing at the time of the property's acquisition by the issuer. Appendix B presents an example of the language of this type of covenant.

Restrictions on payment of dividends: Dividend constraints appear in about 54 of the 415 (about 13%) sample debt contracts. Restrictions on dividend policy constrain the shareholders' abilities to deplete assets and reduce the collateral available to bondholders in the event of default. Most dividend covenants directly constrain a bank's ability to pay dividends. The typical covenant specifies an inventory of payable funds equal to the sum of the consolidated net income of the company and contributions to capital less the aggregate amount of the dividends paid out as of the date of the offering. Dividend covenants are usually cumulative over the life of the debt issue. Several other debt contracts include less-common dividend restrictions that prohibit the issuer from paying any dividend if the bank's long-term debt-to-equity ratio exceeds the amount specified in the indenture. Appendix B presents an example of the language of this type of covenant.

Panel C of Table 1 also shows that bank debt issued during the 1980s and the 1990s includes fewer covenants compared to that issued during the 1970s. This decline in the

[12] Chatfield and Moyer (1986) also find frequent use of repurchase provisions in debt issued by banks and other finance companies.

restrictiveness of bank debt reflects part of a broader trend towards fewer restrictive covenants in debt contracts. Malitz (1994) examines covenants in industrial debt issues over 1960–1992 and finds a similar decline in restrictive covenants in debt issued in the 1980s.

To facilitate comparison, I focus on bank debt issues during a period that overlaps with the period studied by Malitz (1994). I also partition the sample over time to match roughly the time partitions in Malitz's study. Malitz examines 414 debentures issued by industrial firms during 1960–1992. Of these, 148 debentures were issued during 1970–1979 and 171 debentures were issued during 1980–1992.

Malitz (1994) provides only overall numbers for the incidence of merger restrictions and asset sale restrictions. The comparison shows that bank debt offers relatively fewer merger restrictions but roughly comparable restrictions on asset sales. More strikingly, debt issued by bank holding companies is significantly less restrictive in terms of debt and dividend restrictions. Restrictions on creating liens (negative pledge) appear in 28 percent of bank debt contracts while they appear in almost 95 percent of industrial debt issues. Similarly, restrictions on debt appear in only 3.5 percent of bank debt contracts while they appear in almost 26 percent of industrial debt issues. Restriction on payments of dividends appears in 15 percent of bank debt contract while they appear in almost 28 percent of industrial debt issues.

Malitz (1994) also shows a significant decline in both debt and dividend restrictions in industrial debt issues during the 1980s compared to those during the 1970s.[13] While roughly 51 percent of industrial debt issues had a restriction on debt issuance in 1970–1979, only 5 percent did so during the more recent 1980–1992 period. Similarly, while 55 percent of industrial debt issues included a dividend restriction during 1970–1979, only 5 percent did so during 1980–1992. Paralleling the decline in debt and dividend restrictions in industrial debt issues, bank debt issues include fewer restrictions on the issuance of debt and on the payment of dividends in the 1980–1992 period compared to the 1970s. An exception to these trends is the restriction on liens. While bank debt contracts showed relatively fewer restrictions on liens during 1980–1992, industrial debt issues continued to include them at the same rate as before.

Table 2 reports the frequency distribution of debt ratings, the median offering yield spreads, and the bank size by debt rating. Approximately 80 percent of the debt issues are rated A or above; about 14 percent are rated Baa or Ba; and 6 percent are unrated. For the rated bonds, there is a monotonic relation between yield spreads and Moody's debt rating—the higher the debt rating, the lower the yield spread, suggesting that market investors in bank debt are sensitive to the default risk reflected in debt ratings. The last column shows that generally higher debt ratings are associated with larger bank holding companies.

Table 3 presents descriptive statistics on the characteristics of bank debt and its issuers. The average yield spreads (over comparable Treasury securities) appear statistically indistinguishable across time periods. Maturities of bank debt significantly declined during the 1981–1988 period compared with the earlier 1974–1980 period, consistent with results

[13] Malitz does not report numbers for the change in restrictions on investment policy so a comparison of how merger and asset sale restrictions have changed for industrial debt is not possible.

Table 2
Number of debt offerings, median offering yield spreads, and total real assets by Moody's debt rating category, 1974–1995

Moody's bond rating	Number (%)	Median offering yield spreads in basis points	Median total real assets (mill. 1980 dollars)
Aaa	24 (6)	68	48, 227
Aa	85 (21)	72	36, 752
A	207 (50)	87	23, 373
Baa	71 (17)	117	27, 568
Ba	6 (1)	172	11, 306
B	1 (0)	223	2461
Not rated	21 (5)	106	10, 435

Notes. The sample comprises 415 fixed-rate, nonconvertible, US dollar debt contracts offered by 72 US bank holding companies from 1974 to 1995. Information on Moody's debt ratings at the time of debt issue is obtained from the annual issues of Moody's Bank and Finance manuals. Offering yield spread is the difference between the offering yield on the bond issue and the yield to maturity on a same-date Treasury note of comparable maturity. Total assets of the bank holding company issuer are obtained from Compustat tapes and are deflated to constant 1980 dollars using the GDP deflator.

presented by Barclay and Smith (1995), who find that debt maturities become shorter following deregulation in the airline, railroad, trucking, and telecommunications industries. Both the mean and median debt maturities increased to 10 years following the re-regulation of the banking industry in 1989. During the 1980s and the 1990s, debt ratings were lower, while the bank holding companies issuing subordinated debt were larger (in real terms) compared with those that issued debt during the 1970s.

The last two panels of Table 3 provide descriptive statistics of the proxies for bank charter values. The q ratios of bank holding companies that issued subordinated debt during 1981–1988 are similar to those that issued debt during the earlier period. In contrast, bank debt issuers in 1989–1995 had significantly higher q ratios. The decline in the demand deposit ratio in the 1980s, however, does suggest that banks' market power in the deposit markets eroded during the 1980s. Overall, these time period comparisons provide mixed evidence of changes in the charter values of subordinate debt issuers in the 1980s.

5. Empirical model and results

5.1. Model setup

As indicated in the Introduction, the offering yield spreads are determined jointly with the decision to include covenants in debt contracts. Restrictive covenants provide both benefits and costs to issuers. The benefit of including covenants is that they limit managerial opportunism and risk taking; investors therefore require lower yields on more restrictive contracts, all else equal. But covenants also reduce managerial flexibility. Thus, an issuer's choice of covenants depends on a consideration of the expected reduction in yield spreads from offering a more restrictive contract and the net other costs associated with reduced managerial flexibility. The decision to include covenants in debt contracts can be written

Table 3
Debt and issuer characteristics, 1974–1995

	Years	Mean	Median	Std. dev.	Minimum	Maximum
Offering yield spreads	**1974–1995**	0.99	0.88	0.55	0.02	4.18
	1974–1980	1.01	0.89	0.52	0.20	2.34
	1981–1988	0.96	0.84	0.51	0.23	4.18
	1989–1995	1.03	0.94	0.60	0.02	3.71
Debt maturity (in years)	**1974–1995**	10.05	10.00	6.24	1.50	40.00
	1974–1980	14.37	10.00	9.79	3.00	30.00
	1981–1988	8.19***	7.08***	4.37	1.50	30.00
	1989–1995	10.92***,(***)	10.00(***)	5.82	1.50	40.00
Bond rating dummy	**1974–1995**	0.26	0.00	0.44	0.00	1.00
	1974–1980	0.65	1.00	0.48	0.00	1.00
	1981–1988	0.32***	0.00***	0.47	0.00	1.00
	1989–1995	0.06***,(***)	0.00***,(***)	0.23	0.00	1.00
Book value of assets (in millions of 1980 dollars)	**1974–1995**	46,252	28,723	45,461	1477	153,266
	1974–1980	28,392	14,020	35,772	1842	114,920
	1981–1988	52,946***	32,067***	52,386	1477	147,687
	1989–1995	43,870***,(*)	30,009***	36,497	2090	153,266
Market-to-book assets ratio (q)	**1974–1995**	0.95	0.95	0.06	0.70	1.12
	1974–1980	0.94	0.93	0.03	0.87	1.00
	1981–1988	0.94	0.94	0.04	0.84	1.12
	1989–1995	0.97***,(***)	0.98***,(***)	0.07	0.70	1.10
Demand deposits/ total deposits	**1974–1995**	0.21(**)	0.21	0.08	0.03	0.65
	1974–1980	0.30	0.30	0.10	0.09	0.60
	1981–1988	0.21***	0.21***	0.08	0.03	0.65
	1989–1995	0.19***,(**)	0.20***,(*)	0.06	0.05	0.42

Notes. The sample comprises 415 debt offers made by 72 bank holding companies from 1974 to 1995. Offering yield spread is offering yield on the bond issue minus the yield to maturity on a same-date Treasury note of comparable maturity. The bond-rating dummy takes a value of 1 if the bond is rated *Aa* and above, and 0 otherwise. The q ratio equals the market value of equity plus the book values of preferred stock, minority interest, subordinated notes and debentures, deposits, and borrowings, divided by the book value of assets. The table provides tests for equality in means (t-test) and medians (Wilcoxon rank-sum test). The 1981–1988 row tests for equality with the 1974–1980 period. The 1989–1995 row tests for equality with the 1974–1980 period and also with the 1981–1988 (in parentheses).

* Significant at the 10% level.
** Idem., 5%.
*** Idem., 1%.

in the form of a probit model:

$$I_i = \gamma(y_{1i} - y_{2i}) + Z_i'\xi - \varepsilon_i \tag{1}$$

where I_i equals one if covenants are included and zero otherwise, y_{1i} is the yield spread on bonds without covenants, and y_{2i} is the offering yield spread on bonds with covenants. Thus, $(y_{1i} - y_{2i})$ is the expected reduction in yield from offering a more restrictive contract in place of a less restrictive one. The vector Z_i contains variables that affect net other costs of including covenants. In the empirical specification, Z_i contains proxies for the bank charter value, firm size, and time-period dummies.

The offering yield relations when covenants are included and when covenants are not included are specified separately as a function of the vector X_i:

$$y_{1i} = X_i'\beta_1 + u_{1i}, \tag{2}$$

$$y_{2i} = X_i'\beta_2 + u_{2i}. \tag{3}$$

Equation (2) is the yield spread regression for bonds without covenants and Eq. (3) is for bonds with covenants. The model consisting of Eqs. (1)–(3) cannot be estimated directly since the observed yield is a conditional outcome and depends on covenant inclusion. The error terms, u_{1i} and u_{2i}, are correlated with ε_i and the conditional expectations, $E(u_{1i} \mid I_i = 0)$ and $E(u_{2i} \mid I_i = 1)$, are both non-zero. Lee (1978) provides a two-stage procedure to correct for this bias, which is sketched below. More details are provided by Lee (1978) and Maddala (1983).

The first step of the procedure is to substitute the yield equations, (2) and (3), into the covenant choice equation (1) and obtain a reduced form model as follows:

$$I_i = \gamma\left(\left(X_i'\beta_1 + u_{1i}\right) - \left(X_i'\beta_2 + u_{2i}\right)\right) + Z_i'\xi - \varepsilon_i, \tag{4}$$

or

$$I_i = X_i'\theta + Z_i'\xi + \nu_i, \tag{5}$$

where $\nu_i = \gamma(u_{1i} - u_{2i}) - \varepsilon_i$ and $\theta = \gamma(\beta_1 - \beta_2)$. The reduced-form Eq. (5) is estimated using a probit maximum likelihood procedure and the model prediction, $\hat{\psi}_i = X_i'\hat{\theta} + Z_i'\hat{\xi}$, is used to generate the inverse Mills ratio, defined as $\phi(\hat{\psi})/(1 - \Phi(\hat{\psi}))$ when covenants are not included and $-\phi(\hat{\psi})/\Phi(\hat{\psi})$ when covenants are included. Here, ϕ is the standard normal density function and Φ is the standard normal cumulative distribution function.

The second step of the procedure is to augment Eqs. (2) and (3) with the inverse Mills ratio as the right-hand side variables. The OLS on the augmented regression for the two sub-samples provides consistent estimates of β_1 and β_2 since the addition of the inverse Mills ratio corrects for a non-zero expectation of errors.

Finally, the difference in predicted yield spreads for the entire sample (without and with covenants), $\hat{y}_{1i} - \hat{y}_{2i} = (X_1'\hat{\beta}_1 - X_2'\hat{\beta}_2)$, is substituted in the structural probit equation (1) to obtain consistent estimates of structural probit model parameters γ and ξ.[14]

5.2. *Estimates from yield spread regressions*

In estimating the self-selection model outlined in Section 5.1, it is important to note that the first stage reduced-form probit model includes all independent variables included in the yield spread regressions and the covenant choice models. Thus, the reduced form will be different for each covenant choice model (in Table 5). Therefore, Table 4, which reports the results from the offering yield spread regressions, provides four different sets of estimates using different inverse Mills ratios depending on which covenant choice regression is used as part of the reduced form model. The estimates from the first stage reduced-form probit

[14] For a proof of the consistency of the structural probit estimates, see Lee (1979).

Table 4
Selectivity-bias adjusted yield spread regressions by contract restrictiveness, 1974–1995

	Offering yield spread							
	Model (1)		Model (2)		Model (3)		Model (4)	
	285 debt contracts without covenants (1)	130 debt contracts with covenants (2)	285 debt contracts without covenants (3)	130 debt contracts with covenants (4)	285 debt contracts without covenants (5)	130 debt contracts with covenants (6)	285 debt contracts without covenants (7)	130 debt contracts with covenants (8)
Intercept	8.884	7.590	1.946	2.662	−2.572	8.036	1.492	2.451
	(3.0)***	(6.1)***	(0.8)	(3.3)***	(−0.4)	(5.8)***	(0.5)	(2.9)***
q ratio	−1.464	−5.609			6.689	−6.219		
	(−1.8)*	(−5.0)***			(0.9)	(−4.6)***		
q ratio × 1981–1988 dummy					−7.109	−0.058		
					(−0.8)	(−0.1)		
q ratio × 1989–1995 dummy					−7.516	0.821		
					(−1.0)	(0.4)		
Demand deposits ratio			0.442	−1.153			11.243	−0.899
			(0.5)	(−1.5)			(3.6)***	(−1.3)
Demand deposits ratio × 1981–1988 dummy							−13.335	−0.669
							(−4.2)***	(−0.3)
Demand deposits ratio × 1989–1995 dummy							−8.715	6.104
							(−2.6)***	(2.2)**
Aaa dummy	−0.722	−0.543	−0.791	−0.595	−0.817	−0.490	−0.665	−0.559
	(−6.5)***	(−3.2)***	(−6.8)***	(−3.3)***	(−6.4)***	(−2.4)**	(−6.5)***	(−2.4)**
Aa dummy	−0.577	−0.472	−0.695	−0.361	−0.678	−0.425	−0.581	−0.321
	(−6.5)***	(−2.8)**	(−6.9)***	(−2.0)**	(−6.6)***	(−2.5)**	(−6.5)***	(−1.6)
A dummy	−0.182	−0.144	−0.495	0.098	−0.413	−0.063	−0.322	0.157
	(−1.4)	(−0.6)	(−3.8)***	(0.5)	(−3.1)***	(−0.3)	(−2.6)**	(0.6)
Log of debt maturity	−0.111	0.205	0.091	0.011	0.022	0.158	0.040	0.003
	(−1.0)	(1.3)	(0.9)	(0.1)	(0.2)	(1.1)	(0.4)	(< 0.1)
Log of total assets	−0.141	−0.133	−0.077	−0.142	−0.106	−0.148	0.140	−0.140
	(−3.1)***	(−2.9)***	(−1.6)	(−2.7)***	(−1.7)*	(−1.9)*	(−2.5)**	(−1.6)
Equity capital/ Asset ratio	−19.047	−1.635	−14.530	−10.792	−15.384	−2.772	−20.196	−10.584
	(−4.4)***	(−0.4)	(−3.8)***	(−2.2)**	(−3.7)***	(−0.6)	(−4.1)***	(−1.6)
Sinking fund dummy	1.156	0.012	0.468	0.272	0.659	0.113	0.521	0.290
	(2.8)***	(< 0.1)	(1.1)	(1.1)	(1.6)	(0.4)	(1.7)*	(1.0)
Call provision dummy	0.326	−0.085	0.003	0.152	0.090	−0.015	0.108	0.158
	(1.8)*	(−0.5)	(< 0.1)	(0.9)	(0.6)	(−0.1)	(0.8)	(1.1)
1981–1988 dummy	−0.957	−0.007	0.305	−0.610	6.598	−0.152	3.914	−0.508
	(1.8)*	(< 0.0)	(0.5)	(−1.1)	(0.9)	(< 0.0)	(3.5)***	(−1.1)
1989–1995 dummy	−1.001	0.192	0.465	−0.797	7.080	−0.903	3.005	−1.993
	(−1.6)	(0.3)	(0.6)	(−1.1)	(1.1)	(−0.4)	(2.3)**	(−2.4)**
Inverse Mills ratio	−2.752	0.029	0.475	−2.095	−0.407	−0.903	−1.210	−2.309
	(−1.9)*	(< 0.1)	(0.4)	(−1.1)	(−0.4)	(−0.5)	(−1.0)	(−1.2)
N	285	130	285	130	285	130	285	130
R^2	0.29	0.41	0.28	0.28	0.28	0.41	0.32	0.34

(*continued on next page*)

Table 4 (*continued*)

Notes. Estimates from the regression of offering yield spreads on beginning-of-period q ratio, beginning-of-period demand-deposit ratio, interaction terms between q ratio and time dummies, interaction terms between demand-deposit ratios and time dummies, debt rating dummies, log of debt maturity, log of beginning-of-period total assets, the beginning-of-period equity capital to assets ratio, sinking fund dummy, call provision dummy, time dummies for 1981–1988 and 1989–1995, and a variable defined as $\phi(\psi)/(1-\Phi(\psi))$ for debt issues without covenants and $-\phi(\psi)/\Phi(\psi)$ for debt issues with covenants, where ψ is the reduced-form probit model prediction of the covenant use (based on the corresponding model in Table 5), ϕ is the standard normal density function, and Φ is the standard normal cumulative distribution function (inverse Mills ratio). t-statistics corrected for heteroskedasticity appear in parentheses below the coefficient estimates.

* Significant at the 10% level.

** Idem., 5%.

*** Idem., 1%.

model (Eq. (5)) are not presented because they are difficult to interpret. While one can make predictions regarding the sign of γ, β_1, and β_2, it is difficult to predict the signs of the combinations of these variables as represented by θ.

In Model (1) of Table 4, the independent variables include the q ratio, a set of debt rating dummies, the natural log of debt maturity, a proxy for bank size (the natural log of asset value), the equity-capital-to-asset ratio, dummy variables for call and sinking fund provisions, time dummies for 1981–1988 and 1989–1995, and the inverse Mills ratio. If market discipline exists, then banks with high q ratios are expected to offer subordinated debt with lower yield spreads. Furthermore, debt ratings are expected to affect yield spreads negatively since higher rated debt is expected to have lower default risk. Large banks will have fewer incentives to engage in risk taking because they want to preserve their debt market reputations (Diamond, 1989 and Hirshleifer and Thakor, 1992). Thus, larger banks are expected to offer debt with lower yields spreads. Similarly, banks with high equity-capital-to-asset ratio have weaker incentives to engage in risk taking. Hence, a negative sign on the equity-capital-to-asset ratio is predicted.

In addition, the model includes variables that control for three other features of debt contracts, i.e., debt maturity and call and sinking fund provisions. Debt with longer maturity exacerbates the underinvestment problem and provides shareholders with more flexibility to engage in asset substitution. Hence, debt maturity is expected to affect yield spreads positively. Call provisions in debt contracts are expected to increase offered yield spreads since call provisions provide issuers with valuable options to retire debt before maturity. Sinking fund provisions require the issuing bank to repay a specified portion of the bond issue prior to maturity thereby reducing its default risk. While this leads to the prediction that bonds with sinking funds should offer lower yield spreads, Mitchell (1991) argues that sinking fund provisions are typically attached to riskier bonds. The sign on the sinking fund provision dummy is therefore an empirical issue.

Consistent with the argument that subordinated debt disciplines risk taking, the estimated coefficients on q are negative and significant at the conventional levels for both sub-samples, suggesting that banks with greater risk-taking incentives offer higher yield spreads. The yield spreads are significantly negatively related to debt-rating dummies—the higher the debt rating, the lower the yield spreads. This finding is consistent with Flannery and Sorescu's (1996) argument that effective market discipline by subordinated debtholders requires that yield spreads on bank debt be lower on higher rated debt. The coefficient

on size is negative and significant, consistent with lower default risk on debt issued by large banks. The negative coefficient on bank size is also consistent with investors in debt of large banks believing that they are de facto insured under a TBTF policy.

The equity capital to asset ratio has a negative and significant coefficient in the subsample of debt contracts without covenants, consistent with default risk being lower for banks with high capital ratios. The coefficient on the equity-capital-to-asset ratio is also negative in the sub-sample of debt issues with covenants, but it is not significant. Debt maturity is not significantly related to yield spreads in either subsample, while call and sinking fund provisions are positively related to yield spreads only in the subsample of bonds without covenants; they are unrelated to spreads in the sample with covenants. The coefficient on the inverse Mills ratio is marginally significant in the subsample of bonds without covenants and insignificant in the subsample of debt issues with covenants.

In Model (2), the ratio of demand deposits to total deposits is used as a proxy for bank charter value, with other independent variables remaining the same. The coefficients on the demand-deposit ratio are not significant in either sub-sample. The results on debt rating dummies are consistent with those in Model (1)—the higher the debt rating, the lower the yield spreads. Also, similar to results for Model (1), bank size and the equity-capital-to-asset ratio negatively affect yield spreads in both subsamples of debt contracts.

Model (3) includes q and two additional terms interacting q with the time dummies for 1981–1988 and 1989–1995. These additional interaction terms are added to examine if offering yield spreads on debt contracts was relatively more sensitive to bank charter values during the 1980s. For the subsample of debt contracts without covenants, the results show that yield spreads were not sensitive to the variation in q in the pre-1981 period. The coefficients on the interactions term are also insignificant, suggesting that the sensitivity between spreads and q did not significantly change in the subsequent periods in contracts without covenants.

By contrast, for the subsample of debt issues with covenants, the coefficient on q is significantly negative and the combined coefficient on q and that on q interacted with the 1989–1995 dummy is also significantly negative (p-value $= 0.005$). But the combined coefficient on q and that on q interacted with the 1981–1988 period dummy is not significantly different from zero (p-value $= 0.16$). The findings that yield spreads on subordinated debt were sensitive to bank charter values in both the pre-1981 and the 1989–1995 period but that spreads were less sensitive to bank-risk taking in the 1981–1988 period is consistent with the results of other literature that examines yield spreads and reaches a similar conclusion (for example Flannery and Sorescu, 1996). The coefficients on the two interaction terms, however, are not significantly different from zero. Other results from Model (3) are similar to those from Model (1). Spreads decline as debt ratings increase and spreads are lower if debt is issued by larger banks or banks with more equity capital.

Model (4) similarly includes the demand-deposit ratio and two additional interaction terms between the demand-deposit ratio and time dummies for 1981–1988 and 1989–1995. Similar to Model (3), the objective of including the two interaction terms is to examine if debt contracts become more sensitive to risk taking in a period of increased risk-taking incentives. Here, the time series patterns of sensitivities are more complex. Contrary to expectations, for the subsample of debt issues without covenants, the spreads are positively related to the demand deposit ratio in the pre-1981 period. But as risk taking incentives

increased in the 1980s, the sensitivity of spreads to demand deposit ratio became negative. The decline in sensitivity is significant and the combined coefficient on the demand-deposit ratio and its interaction term for the 1981–1988 period is also negative and significantly different from zero (p-value $= 0.09$). The sensitivity of spreads to demand-deposit ratio during 1989–1995 is lower compared to that in the pre-1981 period but it is higher compared to that in the 1981–1988 period (p-value < 0.01). In the subsample of debt contracts with covenants, the spreads are not sensitive to the demand-deposit ratio in both the pre-1981 period and in 1981–1988, but again, contrary to predictions, they become positively related in 1989–1995. Other results in Model (4) are generally similar to those reported above.

5.2.2. Bank charter values and contract restrictiveness

Table 5 presents results of the structural probit models that examine how bank charter values affect the likelihood of restrictive covenants in bank debt contracts. The dependent variable is a covenant restrictiveness dummy that takes a value of one if the debt contract includes covenants and zero otherwise.

Consistent estimates of the structural probit models are obtained by augmenting the covenant choice equation with the predicted reduction in yield spreads from offering a more restrictive contract. The predicted yield spreads for contracts without covenants and for contracts with covenants is obtained as the product of regression coefficient estimates listed in Table 4 and the corresponding independent variables, excluding the inverse Mills ratio. Four different probit models are given in Table 5 and the expected reduction in yield spreads in each model is estimated from the appropriate yield spread equation in Table 4.

Thus, in the first equation, the independent variables are the beginning-of-period q ratios, the natural log of assets, the reduction in yield spread from offering more restrictive contracts estimated from Model (1) in Table 4, and time dummies for 1981–1988 and 1989–1995. Asymptotic z-statistics corrected for heteroskedasticity are reported in parentheses. Consistent with the argument that subordinated debt disciplines bank risk taking, the results show that bank holding companies with low charter values are significantly more likely to include restrictive covenants in their debt contracts. The coefficient on the q ratio is negative and significant at the 5 percent level. Figure 1 plots the predicted probabilities of including covenants for deciles of the q ratio, holding all other variables constant at their mean. The predicted probability of including restrictive covenants steeply declines as q increases.

The results also show that the likelihood of including covenants in bank debt contracts is significantly positively related to the expected reduction in yield spreads with covenants. Note that the coefficient standard errors on the expected reduction in yield spread are likely to be understated because it is a generated regressor. The finding, nevertheless, suggests that covenants are used if the yield spreads are lower than they would have been had the covenants not been used. In other words, subordinated debtholders find covenants useful in restricting bank risk taking and therefore require lower yields when more restrictive contracts are offered.

The coefficients on the time dummies are both negative, suggesting that bank holding companies offered significantly fewer restrictive covenants on debt offered during the

Table 5
Probit regressions predicting the restrictiveness of bank debt contracts, 1974–1995

	Model (1)		Model (2)		Model (3)		Model (4)	
	Coefficient estimate (z-stat.)	Marginal effects	Coefficient estimate (z-stat.)	Marginal effects	Coefficient estimate (z-stat.)	Marginal effects	Coefficient estimate (z-stat.)	Marginal effects
Intercept	3.027		1.779		−0.619		1.225	
	(1.4)		(1.8)*		(−0.1)		(1.0)	
q ratio	−4.911	−1.656			3.041	1.022		
	(−2.4)**				(0.4)			
q ratio × 1981–1988 dummy					−13.556	−4.555		
					(−1.9)*			
q ratio × 1989–1995 dummy					−1.048	−0.352		
					(−0.2)			
Demand deposits/total deposits			−3.381	−1.124			6.231	2.087
			(−3.7)***				(1.5)	
Demand deposits/total deposits× 1981–1988 dummy							−11.278	−3.777
							(−2.7)***	
Demand deposits/total deposits× 1989–1995 dummy							−8.462	−2.834
							(−1.5)	
Log of total assets	−0.057	−0.019	0.030	0.010	−0.089	−0.030	−0.037	−0.012
	(−0.7)		(0.4)		(−1.0)		(−0.5)	
Expected reduction in yield spread with covenants	0.867	0.292	1.042	0.347	0.075	0.025	0.646	0.216
	(3.5)***		(3.4)***		(0.2)		(2.0)**	
1981–1988 dummy	−0.648	−0.219	−1.478	−0.491	11.006	3.699	1.406	0.471
	(−1.7)*		(−4.1)***		(1.7)*		(1.0)	
1989–1995 dummy	−0.968	−0.326	−2.104	−0.700	−1.747	−0.587	−0.121	−0.041
	(−1.8)*		(−4.5)***		(−0.3)		(−0.1)	
N	415		415		415		415	
Model χ^2 p-value	0.000		0.000		0.000		0.000	

(*continued on next page*)

Table 5 (*continued*)
Notes. The dependent variable is a dummy variable that takes a value of one for bank debt contracts that include covenants and zero otherwise. Independent variables are the beginning-of-period q ratios, beginning-of-period demand deposit ratio, the natural log of beginning-of-period total assets, the expected reduction in yield spreads conditional on covenant choice (estimated from the predictions values of the corresponding model in Table 4), and time period dummies for 1981–1988 and 1989–1995. The q ratio equals the market value of equity plus the book value of liabilities divided by the book value of assets. The demand-deposit ratio equals the demand deposits divided by total deposits. The table also reports the marginal effects estimated as the partial derivative of the predicted probability with respect to a given independent variable. Asymptotic z-statistics corrected for heteroskedasticity appear in parentheses below the coefficient estimates.
* Significant at the 10% level.
** Idem., 5%.
*** Idem., 1%.

1980s and the 1990s (the coefficient on the 1981–1988 dummy, however, is not significantly different from that on the 1989–1995 dummy).

Table 5 also reports the marginal effects for probit models estimated as the partial derivative of the predicted probability with respect to a given independent variable. The marginal effects show a large effect of q on the likelihood of restrictive covenants in bank debt contracts. To further gauge the economic significance of these results, I calculate changes in the predicted probabilities of including covenants for a one standard deviation change in each independent variable (or from 0 to 1 in the case of period dummies), while the other variables are held constant at their respective mean values. I find that a one standard deviation increase in q reduces the predicted probability of offering restrictive covenants by

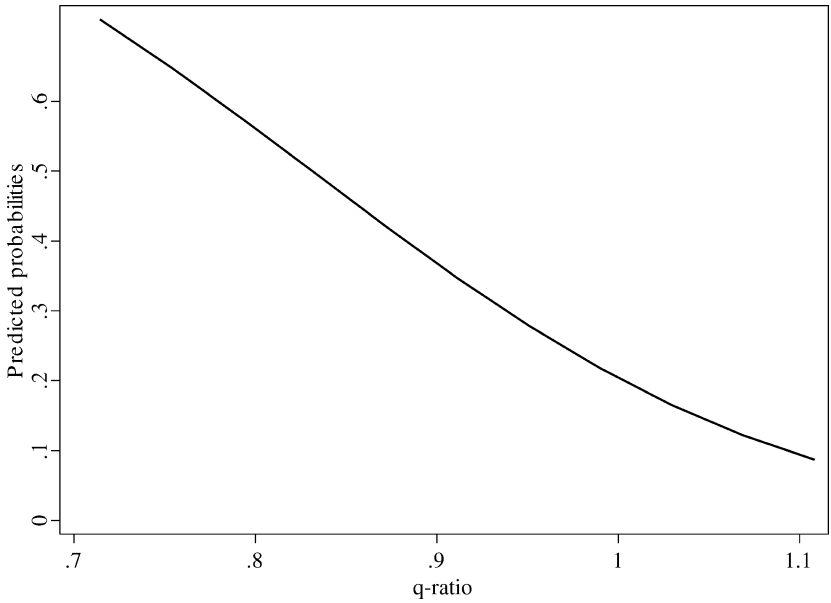

Fig. 1. Plot of predicted probabilities of covenant choice (estimated from the coefficients in Model (1) of Table 5) against the q ratio, holding all other variables constant at their mean.

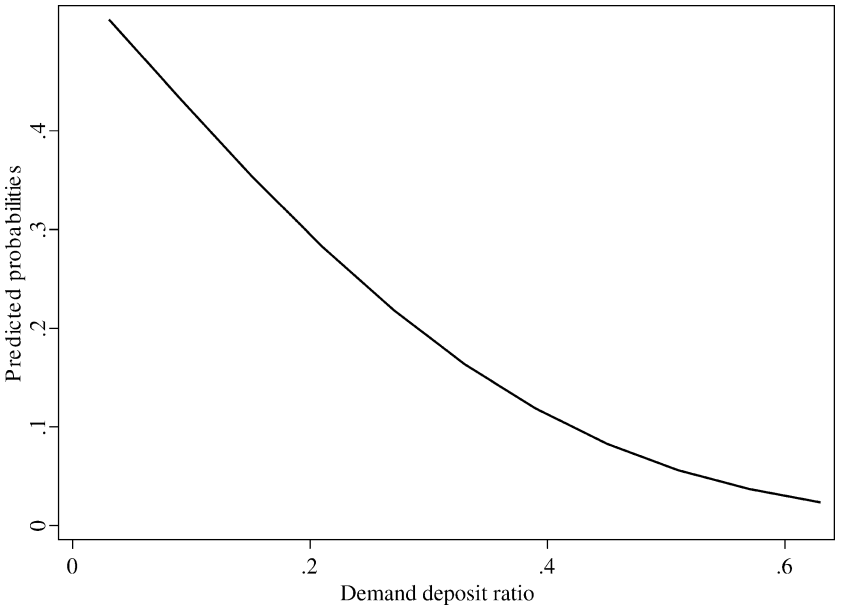

Fig. 2. Plot of predicted probabilities of covenant choice (estimated from the coefficients in Model (2) of Table 5) against the demand deposit ratio, holding all other variables constant at their mean.

0.08. Also, a one standard deviation increase in the expected reduction in the yield spreads from offering covenants increases the predicted probability of including covenants by 0.21. Consistent with the previous results on the large decline in covenant use in the 1980s and 1990s, the predicted probabilities of covenants drop by 0.11 in 1981–1988 and by 0.16 in 1989–1995.

In column (2) of Table 5, the ratio of demand-deposits-to-total-deposits replaces q as a proxy for the bank charter value. Other independent variables remain the same. The coefficient on the demand-deposit ratio is negative and significant at the 1 percent level, consistent with the prediction that banks with low charter values, and hence with greater incentives to take risks, offer more restrictive contracts. The marginal effect of the demand-deposit ratio on the predicted probability of including covenants is also large. Furthermore, a one standard deviation increase in the demand deposit ratio reduces the predicted probabilities of covenants in bank debt contracts by 0.10. Figure 2 plots the predicted probabilities of including covenants for deciles of the demand deposit ratio, holding all other variables constant at their mean. Consistent with previous results, this figure also shows that the predicted probability of including restrictive covenants steeply declines as the demand deposit ratios increase. In sum, these results suggest that changes in bank charter values have statistically significant and economically large effects on the probability of offering restrictive contracts.

The coefficient estimate on the expected reduction in the yield spread is once again positive and significant at the 1 percent level. The coefficients on two period dummies are negative and significant. While both time dummies are negative, the decline in covenants

is significantly greater in the 1989–1995 period compared with that during 1981–1988 (the point estimate of the coefficient on the 1981–1988 dummy is significantly different than that on the 1989–1995 dummy with $\chi^2 = 8.2$ and a p-value of less than 0.01).

5.2.3. Sensitivity of contract restrictiveness to bank charter values during the 1981–1988 period

To examine if the structure of debt contracts was relatively more sensitive to bank charter values during the 1980s, the baseline covenant choice regressions are augmented with additional variables interacting the proxies for bank charter values with time dummies for 1981–1988 and 1989–1995. My principal interest is to examine if the coefficient on the variable interacting q with the dummy variable for 1981–1988 reveals an increase in the sensitivity of the covenant choice and the bank charter values during this period.

The results, contained in the third and the fourth column of Table 5, demonstrate that the likelihood of including restrictive covenants in bank debt contracts is systematically related to risk-taking incentives only during the 1981–1988 period. The coefficient on q is not significantly different from zero in the pre-1981 period. However, the coefficient on the interaction term between q and the 1981–1988 dummy has the expected negative sign and it is significant at the 10 percent level. This suggests that the sensitivity of spreads to q during 1981–1988 differs marginally from that during the pre-1981 period. Further tests show that the coefficient on q during 1981–1988 (the sum of the coefficient on q and that on q interacted with the 1981–1988 period) is significantly different from zero (χ^2 of 8.7 with a p-value of < 0.01).

By contrast, the sum of the estimated coefficients on q and its interaction with the 1989–1995 dummy is not significantly different from zero. The coefficient on the variable interacting q with the 1989–1995 dummy is also insignificant, suggesting that the sensitivity during 1989–1995 is not significantly different from the sensitivity during the pre-1981 period. Finally, tests show that the coefficient on q interacted with the 1981–1988 dummy is significantly different from the coefficient on q interacted with the 1989–1995 dummy (χ^2 of 3.5 with a p-value $= 0.06$).

The last column of Table 5 presents results from a similar specification but with q replaced by the demand-deposit ratio as a measure of the bank charter value. The results are qualitatively identical to those reported in the third column. Overall, the results show that the sensitivity between the contract restrictiveness and bank charter values is significantly more pronounced during the less-regulated, more-competitive 1981–1988 period. The coefficient on the demand-deposit ratio is not significantly different from zero during the pre-1981 period. But the combined coefficient on the demand deposit ratio and that on the demand-deposit ratio interacted with the 1981–1988 dummy is significantly different from zero (χ^2 of 14 with a p-value < 0.01). By contrast, the sum of the coefficients on the demand deposit ratio and the demand-deposit ratio interacted with the 1989–1995 dummy is not significantly different from zero (χ^2 of 0.96 with a p-value $= 0.33$). Also, the coefficient on the demand deposit ratio interacted with the 1981–1988 dummy is not significantly different from the coefficient on the demand deposit ratio interacted with the 1989–1995 dummy (χ^2 of 1.0 with a p-value $= 0.31$).

Figures 3 and 4 plot the relation between the probability of covenant use and the q ratio for different time periods. Consistent with the results reported in columns (3) and (4) of

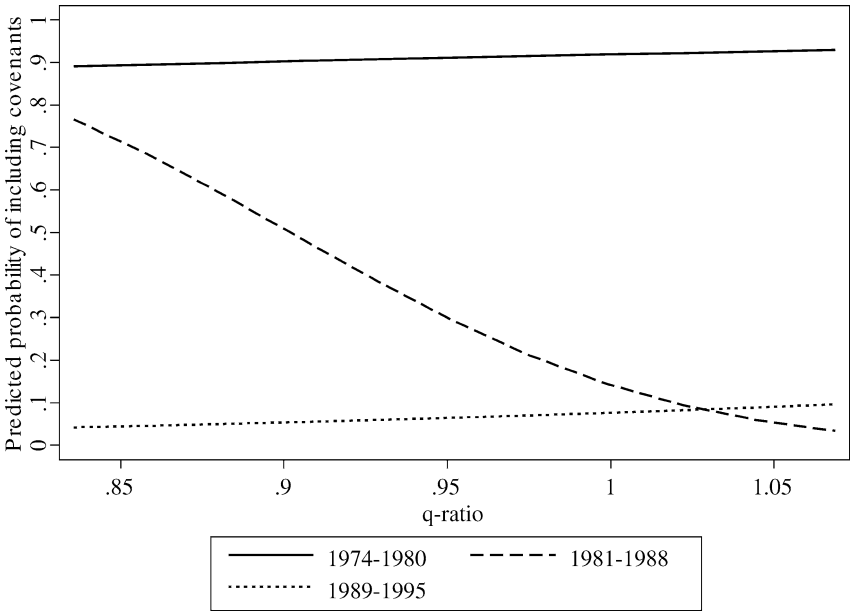

Fig. 3. Plots of predicted probabilities of covenant choice against the q ratio during the 1974–1980, 1981–1988 and 1989–1995 periods. All other variables are held at their mean.

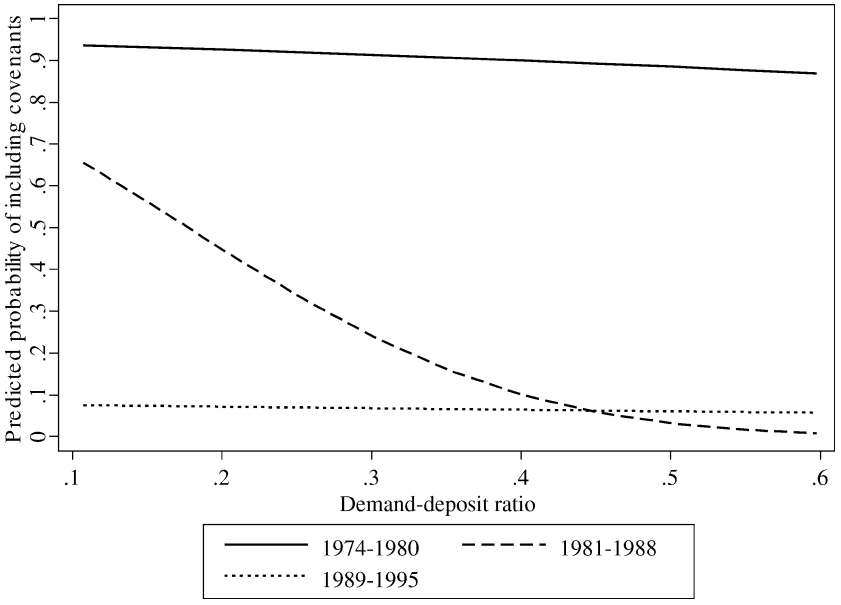

Fig. 4. Plots of predicted probabilities of covenant choice against the demand deposit ratio during the 1974–1980, 1981–1988 and 1989–1995 periods. All other variables are held at their mean.

Table 5, the plots show that the negative relation between the predicted probability of including covenants and the bank charter value proxy is evident only in the 1981–1988 period. Other periods show no significant relation.

5.3. Bank charter values and restrictions on investments, dividends, and financing

The analysis so far has focused on how bank charter values affect the yield spreads and existence of restrictive covenants in subordinated bank debt. However, as described in Section 4, restrictive covenants in bank debt can be classified into three different categories—restrictions on investments, restrictions on dividends, and restrictions on financing. These covenants attempt to protect bondholders by restricting payments of dividends, the issuance of additional debt, acquisitions of other firms, and disposition of assets including sales of shares in a subsidiary. The objective of this section is to examine how bank charter values affect the likelihood of each of these restrictive covenants in bank debt issues. Are debt issues by banks with low charter values more likely to include covenants that restrict some actions but not others?

Banks with low charter values are likely to have greater incentives to pay higher dividends, issue additional debt and engage in risk-increasing investments. Thus, one might predict that banks with low q ratios are more likely to include restrictions in all three categories.[15] However, it is possible that some covenants are complements and some are substitutes. Complementarities arise because debt contracts are designed to constrain incentives of banks to engage in risk taking along several dimensions. For example, when bank charter values are low, banks will have incentives to engage in greater risk taking but they will also have incentives to issue more debt. Poor performance also makes it likely that dividend covenants become binding. Subordinated debt, which, for example, includes debt restrictions but no dividend or investment restrictions may be ineffective in mitigating risk-taking incentives.

On the other hand, some of the covenants may be substitutes. In particular, Smith and Warner (1979) suggest that a firm's investment, dividend and financing policies are linked through a cash flow identity. Thus, covenants restricting a firm's dividend and financing policies can be written in a way that the covenant places an implicit constraint on the investment policies of the firm. While there is not much in the way of theory to guide how covenant packages are determined in equilibrium, the discussion so far suggests that we should expect to see complementarity between debt, dividend and investment restrictions but we should also expect to see some substitutability between restrictions on investments and those on dividends and debt.

Results from structural probit regressions that examine the likelihood of restrictions on investments, debt, and dividends are presented in Table 6. The independent variables in the first set of regressions (presented in columns (1), (1′), and (1″)) are the beginning-of-period q, the natural log of beginning-of-period total assets, the expected reduction in

[15] The extent to which regulators restrict certain bank activities but not others may also affect private incentives to constrain banks. For example, federal and state regulators can impose direct constraints on a bank's ability to pay dividends, while capital adequacy requirements that require a certain minimum level of equity capital constrain a bank's ability to increase debt levels (Black and Shevlin, 1999).

Table 6
Probit regressions predicting the probability of a covenant category being included in bank debt contracts, 1974–1995

	Restrictions on investment			Restrictions on debt			Restrictions on dividends		
	(1)	(2)	(3)	(1′)	(2′)	(3′)	(1″)	(2″)	(3″)
q ratio	−2.387	1.089	−0.481	−5.242	7.894	12.421	−7.114	0.499	−2.637
	(−1.0)	(0.2)	(−0.1)	(−2.5)**	(1.5)	(1.5)	(−2.8)***	(0.1)	(−0.5)
q ratio × 1981–1988 dummy		−7.904	−5.725		−18.622	−18.765		−19.276	−16.110
		(−1.2)	(−0.9)		(−3.0)***	(−2.0)**		(−2.5)**	(−1.8)*
q ratio × 1989–1995 dummy		−3.553	−1.747		−4.410	-8.176		0.173	0.019
		(−0.7)	(−0.3)		(−0.8)	(−0.9)		(< 0.1)	(0.0)
Log of total assets	−0.271	−0.296	−0.223	−0.097	−0.115	−0.293	0.393	0.221	0.339
	(−3.2)***	(−3.4)***	(−2.4)**	(−1.3)	(−1.3)	(−2.9)***	(4.4)***	(2.2)**	(2.8)***
Restrictions on investments						0.603			−0.554
						(2.3)**			(−1.5)
Restrictions on debt			0.566						2.055
			(2.3)**						(6.8)***
Restrictions on dividends			−0.610			2.378			
			(−1.9)*			(7.4)***			
Expected reduction in yield spreads with covenants	0.636	0.675	0.694	0.805	0.710	0.675	0.291	0.821	0.496
	(2.1)**	(2.2)**	(2.0)**	(2.7)***	(1.9)*	(1.6)**	(0.7)	(2.4)**	(1.2)
1981–1988 dummy	−0.813	6.730	4.731	−0.481	16.264	16.893	−1.362	16.676	14.012
	(−3.0)***	(1.0)	(0.8)	(−1.4)	(2.8)***	(1.9)*	(−5.2)***	(2.3)**	(1.7)*
1989–1995 dummy	−1.011	2.456	0.884	−0.953	1.796	6.083	−2.577	-1.639	−1.218
	(−3.0)***	(0.5)	(0.1)	(−1.9)*	(0.3)	(0.7)	(−5.9)***	(−0.3)	(−0.2)
Intercept	6.123	2.153	2.748	4.057	−5.204	−8.603	3.117	−1.563	−1.714
	(2.1)**	(0.4)	(0.6)	(1.9)*	(−1.0)	(−1.1)	(1.2)	(−0.3)	(−0.3)
N	415	415	415	415	415	415	415	415	415
Model χ^2 p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes. The dependent variable equals 1 when a particular restrictive covenant is included in the debt contract. Independent variables are the beginning-of-period q ratios, natural log of total assets, the expected reduction in yield spreads conditional on covenant choice, and time period dummies for 1981–1988 and 1989–1995. Alternative specifications include interaction terms between the q ratio and time period dummies and dummies for the presence of other restrictions in contracts. Asymptotic z-statistics corrected for heteroskedasticity appear in parentheses below the coefficient estimates.

* Significant at the 10% level.
** Idem., 5%.
*** Idem., 1%.

yield spreads with the covenant and the time dummies for 1981–1988 and 1989–1995.[16] The expected reduction in yield spread is estimated in a similar manner to that described above.

The results in Table 6 show that the beginning-of-period q ratios do not affect the likelihood of restriction on investments. By contrast, q has a negative and significant coefficient in the baseline specification for restrictions on debt and dividends. These findings suggest that banks with greater risk-taking incentives are more likely to include restrictions on debt and dividends in their debt contracts.

The second set of equations (presented in columns (2), (2′), and (2″)) include all of the independent variables in the first set and two additional variables interacting the q ratio with the time dummies for 1981–1988 and 1989–1995. The principal variable of interest in the second equation is the interaction term between q and the 1981–1988 dummy. The coefficient on this variable has the expected negative sign in equations predicting the likelihood of debt and dividend restriction, suggesting that the existence of restrictions on debt and dividends in subordinated bank debt became relatively more sensitive to bank charter values during 1981–1988. However, it is insignificant in the equation predicting the likelihood of investment restrictions, suggesting that the sensitivity between the existence of restrictions on investments and bank charter value did not significantly change during the 1981–1988 period.

Tests show that for restrictions on investments, the combined coefficient on q and the interaction term between q and the 1981–1988 dummy is significantly different from zero at the 10 percent level (χ^2 of 2.7). For the equation predicting restrictions on debt, the combined coefficient on q and the interaction between q and the 1981–1988 dummy is significantly different from zero at less than the 1 percent level (χ^2 of 8.6). For the equation predicting restrictions on dividends, the combined coefficient q and the interaction term between q and the 1981–1988 dummy is also significantly different from zero at less than the 1 percent level (χ^2 of 11.1). These results show that during 1981–1988, banks with higher charter values offered significantly fewer restrictions on investments, debt and dividends.

The coefficient on q interacted with the 1981–1988 dummy is not significantly different from the coefficient on q interacted with the 1989–1995 dummy for restrictions on investments. However, for the restrictions on debt, the coefficient on q interacted with the 1981–1988 dummy is significantly different from the coefficient on q interacted with the 1989–1995 dummy (χ^2 of 11.4 with a p-value < 0.01). The tests for the equality of coefficients for the restriction of dividends also show that the coefficient on q interacted with the 1981–1988 dummy is significantly different from the coefficient on q interacted with the 1989–1995 dummy (χ^2 of 11.4 with a p-value < 0.01).

Finally, the third set of equations (presented in columns (3), (3′), and (3″)) includes all of the independent variables in the second equation plus the dummy variables for the presence of covenants in two other restriction categories. Appendix Table A shows significant correlations among restrictions on investments, dividends, and debt. Controlling for the presence of other restrictions in debt contracts does not alter key results, i.e., the

[16] The results are qualitatively similar when the demand-deposit ratio is used as a proxy for charter value.

interaction term between the q ratio and time dummy for 1981–1988 continues to remain negative and significant for restrictions on debt and dividends.

The coefficient on the dummies for investment, debt, and dividend covenants suggest that some covenants are complements while others may be substitutes. Restrictions on debt are positively related to restrictions on investments and to restrictions on dividends, while restrictions on investment are negatively related to restrictions on dividends.

The other results in Table 6 show that size negatively affects the likelihood of restrictions on investment and debt, consistent with large bank holding companies having better reputations in debt markets, which mitigates moral hazard problems. In contrast, size positively affects the likelihood of dividend restrictions. Large banks are more likely to pay dividends and hence a restriction is more binding on them. The coefficient on the expected reduction in the yield spread with covenants has the expected positive sign. Both time dummies (one for 1981–1988 and the other for 1989–1995) are negative in the baseline regression, which is consistent with a decline in the use of covenants in the 1980s and the 1990s. However, the coefficients on these time dummies are not significantly different from each other.

In sum, the results in Table 6 show that low bank charter values significantly increase the likelihood of dividends and additional debt restrictions in bank debt contracts, but they have no effect on investment restrictions. The sensitivities between bank charter values and the presence of debt and dividend restrictions were more pronounced during the 1981–1988 period.

5.4. Further robustness checks

5.4.1. Money-center debt issues

As noted before, the early 1980s witnessed a substantial increase in debt issues by money-center banks attributable perhaps to changes in capital regulations, which may impact the analysis presented here. This concern is addressed in two ways. First, I examine debt contracts issued by money-center banks and find that they are relatively less restrictive and exhibit a significantly smaller sensitivity to bank charter value compared to the debt contracts of other banks. Second, I re-estimate the results by including a dummy variable for money-center debt issues. The key findings of the paper remain unchanged.

5.4.2. Multiple issues by bank holding companies

One econometric issue with the tests is that some banks issued multiple bonds in the same year. Thus, the residuals from one bank's bond issues may be correlated with another, appearing to provide more independent pieces of information than the dataset really does. I therefore conduct two robustness tests that address the issue of multiple bonds in the sample. First, I estimate the probit regressions predicting restrictive covenant classes on various subsamples that randomly draw only one bond issue by a multiple issuer. I find that the basic thrust of the main findings remains unchanged; the coefficient estimates on the variable interacting q with the 1981–1988 dummy are always negative and statistically significant in all of these various subsamples.

Second, I construct a sample that replaces multiple issues during a particular period by a single observation representing the average restrictiveness of bonds issued by the bank.

I then regress the average covenant restrictiveness of bonds by a particular bank in each period on average values of explanatory variables. Again, the main results continue to hold.

5.4.3. Other robustness tests

Additionally, the results are qualitatively insensitive if bank charter value proxies are replaced by their log transformations. Similar results are obtained if the choice equation is estimated using a logit model.

6. Conclusion

The current bank regulatory policy debate is increasingly focused on whether subordinated debtholders can effectively monitor banks' risk-taking incentives. The existing literature mostly examines correlations between spreads on actively traded bank debt and accounting and market risk measures and offers inconclusive evidence. Instead of searching for subordinated debt discipline only in yield spreads, I additionally examine restrictive covenants in bank debt contracts, which represents an alternative channel through which debtholders can discipline bank risk taking.

Evidence in this paper supports the hypothesis that banks with greater risk-taking incentives include more restrictive covenants in their debt contracts. Bank charter values, which determine a bank's incentives to engage in risk taking, significantly negatively affect the likelihood of restrictive covenants in bank debt contracts.

Additionally, I examine if private incentives to monitor bank risk taking are stronger in a less regulated period. Several factors, including greater competition and relatively less stringent regulations in the US banking industry during 1981–1988, suggest that moral hazard problems were more severe during this period. The results show that the relation between the existence of restrictive covenants in bank debt and the bank's charter value is most pronounced during 1981–1988. Overall, these results are consistent with the argument that private risk bearing replaced some direct federal supervision and monitoring during 1981–1988.

These results have immediate relevance to the current debate about the market discipline of bank risk taking. First, the results show an alternative channel through which debtholders may discipline bank risk taking, i.e., more restrictive covenants are included in bank debt issued by banks that have greater incentives to take risks. Second, the results suggest that private risk bearing can replace some regulatory monitoring. As the banking industry became less regulated, contract restrictiveness became more sensitive to a bank's risk-taking incentives. Overall, the findings in the paper strongly support the recent reform proposals arguing for increasing reliance on subordinated debt to discipline bank risk taking.

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Appendix Table A
Correlations between proxies for bank charter value and restrictive covenants

		q	*DEP*	*REST*	*RINV*	*RDIV*	*RDEB*	*q*	*DEP*	*REST*	*RINV*	*RDIV*	*RDEB*
		Panel A. 1974–1995						Panel B. 1974–1980					
q ratio	*q*	1.00						1.00					
		(0.00)						(0.00)					
Demand deposit/	*DEP*	0.29	1.00					0.45	1.00				
total deposit ratio		(0.00)	(0.00)					(0.00)	(0.00)				
Covenant restrictiveness	*REST*	−0.20	0.08	1.00				0.02	−0.19	1.00			
		(0.00)	(0.10)	(0.00)				(0.88)	(0.18)	(0.00)			
Restrictions on investment	*RINV*	−0.01	0.17	0.55	1.00			0.04	−0.08	0.408)	1.00		
		(0.84)	(0.00)	(0.00)	(0.00)			(0.78)	(0.59)	(0.00)	(0.00)		
Restrictions on dividend	*RDIV*	−0.26	−0.12	0.75	0.06	1.00		−0.08	−0.26	0.66	−0.23	1.00	
		(0.00)	(0.02)	(0.00)	(0.25)	(0.00)		(0.57)	(0.06)	(0.00)	(0.10)	(0.00)	
Restrictions on debt	*RDEBT*	−0.16	0.12	(0.89	0.28	0.57	1.00	0.08	0.03	(0.67	−0.13	0.36	1.00
		(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.55)	(0.81)	(0.00)	(0.36)	(0.01)	(0.00)
		Panel C. 1981–1988						Panel D. 1989–1995					
q ratio	*q*	1.00						1.00					
		(0.00)						(0.00)					
Demand deposit/	*DEP*	0.51	1.00					0.40	1.00				
total deposit ratio		(0.00)	(0.00)					(0.00)	(0.00)				
Covenant restrictiveness	*REST*	−0.32	−0.34	1.00				0.30	−0.04	1.00			
		(0.00)	(0.00)	(0.00)				(0.71)	(0.59)	(0.00)			
Restrictions on investment	*RINV*	0.03	−0.03	0.45	1.00			0.04	0.01	0.55	1.00		
		(0.71)	(0.67)	(0.00)	(0.00)			(0.59)	(0.89)	(0.00)	(0.00)		
Restrictions on dividend	*RDIV*	−0.42	−0.44	0.76	−0.02	1.00		−0.09	−0.12	0.60	−0.02	1.00	
		(0.00)	(0.000)	(0.00)	(0.82)	(0.00)		(0.29)	(0.14)	(0.00)	(0.80)	(0.00)	
Restrictions on debt	*RDEBT*	−0.24	−0.24	(0.89	0.23	0.54	1.00	0.05	−0.02	(0.84	0.11	0.46	1.00
		(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.50)	(0.82)	(0.00)	(0.16)	(0.00)	(0.00)

p-values are reported in parentheses.

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Appendix B

Examples of covenants included in subordinated debt contracts issued by bank holding companies. The covenant descriptions are from Moody's Bank and Finance manual.

B.1. Restriction on investment policies

Examples of restriction on mergers included in bank debt contracts.

The following is quoted from an indenture issued by BankAmerica Corp. for 11.375% notes due 1986:

> Co. will covenant that it will not permit the Bank to merge or consolidate unless the surviving corporation is a controlled subsidiary.

The following is quoted from an indenture issued by Citicorp. for 8.45% notes due 2007:

> Co. may not enter into merger or consolidation unless surviving Corp. (a) shall observe covenants of indenture, (b) not be in default to terms of covenants, and (c) is an American Corp.

Examples of covenants that place restriction on sales of shares in a subsidiary.

The following is quoted from an indenture issued by BankAmerica Corp. for 11.375% notes due 1986:

> Co. will covenant that it will not sell, transfer or otherwise dispose of any shares of voting stock of the bank or permit the Bank to issue, sell or otherwise dispose of any shares of its voting stock unless the Bank remains a controlled subsidiary.

The following is quoted from an indenture issued by Barnett Bank of Florida 7.75% sinking fund debentures due 1997:

> Co. or any subsidiary may not issue, sell or dispose of any capital shares of any subsidiary which is a bank or trust Co. whose total assets are equal to more than 10% of assets of all banks and trust Cos. which are subsidiaries. Foregoing will not apply to (1) sales of directors' qualifying shares, (2) sales or dispositions in compliance with

law, (3) sales or dispositions for fair market value, and (4) sales of capital stocks which does not reduce percentage of voting shares owned by Co.

Examples of covenants that place restriction on asset sales.

The following is quoted from an indenture issued by BankAmerica Corp. for 11.375% notes due 1986:

Co. will covenant that it will not permit the Bank to convey or transfer its properties and assets substantially as an entirety to any person, except to a controlled subsidiary.

The following is quoted from an indenture issued by Boatmen's Bancshares for 9.75% notes due 1985:

Co. will not, and will not permit a subsidiary, directly or indirectly, to sell, lease, transfer or otherwise dispose of substantially all the assets of any principal bank subsidiary, except to another principal bank subsidiary or to the corporation.

The following is an example quoted from a repurchase provision included in an indenture issued by First Chicago Corp. for 8.5% notes due 1998:

The holder of each offered note may elect to have such offered note, or any portion thereof which is a multiple of $1000, repaid on June 1, 1993 at its principal amount together with accrued interest of on June 1, 1993. Such election, which is irrevocable when made, must be made within the period commencing on April 1, 1993 and ending at the close of business on May 1, 1993.

B.2. Restriction on payment of dividends

The following are examples of the direct dividend constraint described in Moody's manuals. The following material is quoted from an indenture issued by Barnett Bank of Florida for 9% subordinated notes, due 1983:

Co. may not pay cash dividends or acquire any capital stock in excess of (a) the consolidated net income of Co. and its subsidiaries computed from Jan 1, 1976 through the last day of the second calendar month next preceding the month in which the board of directors authorizes any such action, (b) the net cash proceeds to Co. from the issue or sale subsequent to Jan 1, 1976 of capital stock of Co., or any indebtedness of Co. issued after such date and converted into capital shares of Co. and (c) $10 million.

The following is quoted from an indenture issued by Citicorp. for 8.45% notes due 2007:

Co. may not pay dividends, or make any distribution to its stockholders, payable in shares of stock of Citibank, N.A., or create, assume or incur any pledge, mortgage,

security interest or other encumbrance on any shares or other securities issued by subsidiary and owned by Co. as security for debt for borrowed money, if after giving effect thereto, the adjusted stockholders' equity of Co. would be less than 200% of senior long term debt.

B.3. Restrictions on debt financing

Examples of restriction on liens.

The following is quoted from an indenture issued by Banc One Corp. for 9.75% notes due 1989:

Co. will not create or suffer to exist any mortgage, as security for indebtedness for borrowed money, upon any shares of, or securities convertible into, or options, warrants or rights to subscribe for or to purchase shares of, voting stock of any Bank affiliate owned by Co. or any subsidiary of Co. owning voting stock of a bank affiliate, directly or indirectly, without effectively providing that the securities shall be secured equally and ratably with such indebtedness secured by such mortgage, so long as any such other indebtedness shall be so secured.

The following is quoted from an indenture issued by BankAmerica Corp. for 13.25% notes due 1988:

Co. will covenant not to create, assume, incur or suffer to exist liens upon its properties, subject to certain exceptions specified in the indenture, including among others, (a) liens to secure indebtedness for borrowed money if the debt securities then outstanding are directly secured equally and ratably with all other indebtedness secured by such liens, (b) liens upon property to secure borrowings made to finance the purchase or improvement of such property (c) liens upon property existing at the time of acquisition of such property by Co.

B.4. Examples of other idiosyncratic investment restrictions described in Moody's manuals

The following covenant is from an indenture issued by Boatmen's Bancshares for 9.75% notes due 1985:

The Co. also covenants that it will not, and will not permit a restricted subsidiary directly or indirectly, to make any investment, in cash, securities or in kind, in a subsidiary which is not restricted subsidiary, whether through an advance, loan, purchase of debt or equity securities, contribution to capital, or otherwise, unless immediately after giving effect to such investment corporation could have incurred additional funded debt pursuant to the indenture.

The following covenant is from an indenture issued by First Fidelity for 11.5% notes due 1993:

The indenture provides that Co. will preserve its corporate existence, rights and franchises and, subject to certain exceptions, those of its subsidiary banks.

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