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 is most pronounced during the 1980s, when greater competition and relatively less stringent regulation increased the severity of moral hazard problems in the U.S. 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.

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1. Introduction

Recent banking reform proposals have increasingly advocated the provision of private efforts for monitoring and controlling bank risk as being more effective than direct regulatory oversight. An example is the Basel Committee on Banking Supervision which has designated market discipline as one of the Three Pillars for future financial regulation. Appealing to market discipline, several proposals require mandated issuance of subordinated debt.¹ A key question in this debate is if 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 have typically focused on the relation between subordinated debt yields and bank risk. It is argued that subordinated debt provides direct discipline if subordinated debt yields are positively correlated with bank risk measures. Anticipating higher funding costs from increased bank risk, banks would have an incentive to prudently manage risk taking.² It is also argued that subordinated debt provides indirect discipline if information contained in secondary market prices helps in the supervisory process. The empirical evidence on whether such discipline actually exists is 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. Recently, 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. Flannery and Sorescu (1996) and Flannery (1998), and Flannery (2001) provide a survey of studies examining the relation between yield-spreads and risk measures.

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¹These proposals include those by Kaufman and Benston (1993), Benston (1992), Wall (1989), Keehn (1989), Cooper and Fraser (1988), Benston et al. (1986), and FDIC (1985), 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 U.S. Congress has also recently expressed an interest in subordinated debt as a potential regulatory tool (Gramm-Leach-Bliley Act).

The current literature's focus on yield spreads restricts itself to only one part of the contracting process between bank issuers and market investors in bank subordinated debt. Investors also can directly limit a bank's ability to engage in risk-taking by including restrictive covenants in debt contracts. Covenants impose ex ante restrictions on management's post contract actions and therefore mitigate excessive risk taking incentives (Smith and Warner (1979)). In this paper, I examine how a bank's incentives to take risks affects both offering yield spreads and restrictive covenants in bank debt contracts.

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. Thus, the decision to include covenants depends on the tradeoff between the expected reduction in yield spreads from offering a more restrictive contract and the costs associated with reduced flexibility. The simultaneity between yield spread and covenants has important implications for the tests of market discipline – it suggests that both yield spreads and restrictive covenants in bank debt contracts are important in restricting risk-taking behavior. Debt contracts issued by banks with greater risk-taking incentives could offer higher yield spreads and/or more restrictive covenants. Also, if covenants restrict future risk-taking incentives, then including them will reduce yield spreads.

These predictions are examined on a sample of 415 debt contracts issued by U.S. bank holding companies during the 1974-1995 period. Bank debt frequently includes covenants that restrict investment, dividend, and financing policies. Using an empirical model that account 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 risk-taking incentives.

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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.

Consistent with the existence of market discipline by subordinated debtholders, I find that restrictive covenants are significantly more likely in debt issued by banks with greater incentives to engage in risk taking. There is also some evidence that banks with greater incentives to take risks offer higher yield spreads, but this evidence is weak. Finally, the results show that the likelihood of restrictive covenants is higher when the expected reduction in 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 offering yield spreads and restrictive covenants, this study shows that debtholders have alternative channels to influence and monitor bank risk taking. They can directly constrain a bank's risk taking ability through restrictive covenants in its subordinated debt.

The findings also have several implications of immediate relevance to the current regulatory debate. First, they show that restrictive covenants in bank debt are important disciplining mechanisms. After the Basle 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, recent 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 tool for disciplining excessive risk taking.

In a recent paper, Black and Shevlin (1999) also examine covenants in bank debt issues outstanding at year-end 1979 and year-end 1984.³ These authors show no relation between the market-to-book ratio and restrictive covenants in outstanding bank debt. I also examine the relation between restrictive covenants in bank debt contracts and the market-to-book ratio (q) too, because as I argue later, risk taking incentives are a function of a bank's charter value and a good proxy for a bank's charter value is its q ratio. Black and Shevlin 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 design. Black and Shevlin focus on covenants in the 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 U.S. 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 bank 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 sensitivity between bank 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.

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³ The focus of Black and Shevlin 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.

2. Charter values and the structure of bank debt contracts

A bank's incentive to engage in risk taking depends on the value of its bank charter, which is defined as the present value of a bank's future expected rents (Keeley (1990) and Greenbaum and Thakor (1995)). Chartering authorities grant banks privileged access to profitable lending and deposit-gathering opportunities. Valuable lending relationships and access to markets that are protected from competition and access to generates a stream of monopoly rents for banks with valuable charters. Charter values, therefore, reflect the present value of economic rents from market power in both deposit and loan markets.

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.⁴ The empirical implications are straightforward. As banks with low charter values have greater incentives to take risks, investors in debt securities of these banks will require higher offering yields and/or more restrictive covenants.

The relations between bank charter values and the yields and restrictiveness of debt contracts also 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 debt holders' 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 and thus mitigated banks' risk-taking incentives. However, the regulatory environment and incentives to engage in risk taking changed

dramatically in the early 1980s. 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 regulation, increased competition, and greater moral hazard during a large part of the 1980s suggests that the structure of subordinated debt contracts would be relatively more sensitive to bank charter values during the 1981-1988 period compared to the earlier period.

In contrast, the Basle 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 Basle Capital Accord, subordinated debt that is included in supplementary capital may not be redeemed without prior permission of FDIC or another primary federal regulator.

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⁴ Consistent with these arguments, Demsetz et al. (1996) find a negative relation between charter value and bank risk.

Therefore, banks issuing subordinated debt in the late 1980s and early 1990s are less likely to include covenants that accelerate repayment of 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 is 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) contain 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 would be 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 U.S. dollar fixed-rate debt offers.⁵ 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

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⁵ 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 U.S. bank holding companies are the only ones with publicly traded subordinated notes and debentures.

trust indenture agreement.⁶ Debt issues with imbedded conversion options or warrants⁷ (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 issue 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 the 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.⁸ 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.

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⁶ Several studies use covenant data from Moody's manuals (see, for example, Black and Shevlin (1999), Asquith and Wizman (1990), 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.

⁷ 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.

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 the q ratio 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, as a proxy 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 value (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 the q ratio and covenants is predicted, for example. Although the empirical evidence on this alternative view is mixed,⁹ a direct way to address concerns about the q ratio is to search for a measure of charter value, which 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) find that banks with market power

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⁸ See, for example, Keeley (1990), Demsetz et al. (1996, 1998) and Galloway et al. (1997). Alternative methods of constructing the market-to-book ratio, which exclude goodwill and other intangible assets from total assets in the denominator, yield similar results. Demsetz et al. (1996 and 1998) argue that goodwill in part reflects the charter value derived from a bank's prior acquisitions.

⁹ For example, Begley (1992) 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.

are slow to adjust upward deposit rates in response to rising open market rates and that these same banks are quick to adjust downward deposits rates 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. The data also shows a significant and positive correlation between the q ratio and the demand deposit ratio (Appendix A). 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, U.S. bank holding companies issued substantially more debt during the 1980s and in the 1990s compared with that during the 1970s. The increase in the debt offerings in 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, when prompted by the declining condition of U.S. money-center banks and the banking system, the Federal Reserve and the Comptroller of Currency required minimum capital levels for multinational banks at the same level as for regionals. Consistent with these regulatory changes, the data shows a significant increase 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 restrictions 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.¹⁰ 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 nonbank 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 here are qualitatively identical whether these "other" covenants are included or excluded.

Restrictions on financing policies: Restrictions on financing appear in 109 of 415 (about 26% of the sample) bank debt contracts. 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 its 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 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 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.

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 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.

Panel C provides a comparison of covenants in the bank debt issues examined in this study with those in industrial debt issues in Malitz (1994). To facilitate comparison, I focus on bank debt issues during a period that overlaps with the period in Malitz (1994). I also partition the sample over time that roughly matches the time partitions in her 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.

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¹⁰ Chatfield and Moyers (1986) also find frequent use of repurchase provisions in debt issued by banks and other finance companies.

Malitz provides only overall numbers for the incidence of merger restriction 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 while they appear in almost 26 percent of industrial debt issues. Restriction on payments of dividends appears in 15 percent of bank debt 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 that during the 1970s.¹¹ 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 restriction in industrial debt issues, bank debt issues include fewer restriction on the issuance of debt and on 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 shows relatively fewer restrictions on liens during 1980-1992, industrial debt issues continue 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 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 characteristics of the 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 Barclay and Smith (1995), who also 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 on 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 have significantly higher q ratios. The decline in the demand deposit ratio in the 1980s, however, does suggest that banks' market power in deposit markets eroded during the 1980s. Overall, these time period comparisons provide mixed evidence of changes in charter values of subordinate debt issuers in the 1980s.

5. Empirical model and results

5.1 Model setup

A key objective of the paper is to examine if bank charter values affect the offering yield spreads and restrictive covenants in subordinated debt issued by banks. However, restrictive covenants in debt contracts are determined jointly with offering yield-spreads. Inclusion of covenants has both benefits and costs to issuers. Covenants limit managerial opportunism and risk taking incentives. Issuers benefit from

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¹¹ Malitz does not report numbers for the change in restrictions on investment policy so a comparison of how merger and asset sale restriction have changed for industrial debt is not possible.

including covenants in debt contracts because investor require lower yield spreads 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 model consists of a probit covenant choice model and the two yield spread regressions conditional on the choice of covenants. Formally, this can be written as:

$$I_i = Z_i' \xi + \varepsilon_i \quad (1)$$

$$y_{1i} = X_i' \beta_1 + u_{1i} \quad (2a)$$

$$y_{2i} = X_i' \beta_2 + u_{2i} \quad (2b)$$

where I_i equals one if covenants are included and equals zero otherwise. The vector Z_i contains variables that determine the decision to include covenants. In the empirical specification, Z_i contains proxies for bank charter value, firm size, the expected reduction in yield spread from offering a more restrictive contract and period dummies to reflect the fact that inclusion of covenant restrictions has declined over time. The offering yield relations where covenants are included and where covenants are not included are specified separately as a function of variables X_i . Equation 2(a) is the yield spread regression for bonds without covenants and y_{1i} is the offering yield spread for bonds without covenants. Similarly, Equation 2(b) is the yield spread regression for bonds with covenants and y_{2i} is the offering yield spread for bonds with covenants.

This model cannot be estimated directly because we cannot observe what the yield spreads would have been if the alternative contract had been chosen. The bias arises because the errors in yield spread equations (2a and 2b) are correlated with the error in Eq. 1. Empirically, we need a switching regression model with endogenous switching proposed by Lee (1978) and Heckman (1979). First, the structural model defined by system of Eqs. (1) and (2) is converted into a reduced-form probit model. The consistent estimates of the reduced form parameters are obtained by a probit maximum likelihood

method. The estimates of the reduced form model are used to generate the inverse Mills ratio, defined as $\varphi(\hat{\psi})/(1 - \Phi(\hat{\psi}))$ when covenants are not included and $-\varphi(\hat{\psi})/\Phi(\hat{\psi})$ when covenants are included. Here, φ is the standard normal density function, Φ is the standard normal cumulative distribution function, and $\hat{\psi}$ is the reduced form probit model prediction.

The second step of the procedure is to augment Equations 2a and 2b by adding the inverse Mills ratio. The addition of inverse Mills ratio corrects for nonzero expectation of errors. The OLS on the augmented regression for the two sub-samples provides consistent estimates of β_1 and β_2 . The estimates of the offering yield spreads for bond without covenants can be obtained as the product of the regression coefficient estimates from the yield spread regressions for bonds without covenants and independent variables, excluding the inverse Mills ratio. Similarly, the estimates of the offering yield spreads for bonds with covenants are obtained as the product of the regression coefficient estimates and independent variables, excluding the inverse Mills ratio. Finally, this estimate of reduction in offering yield can be substituted into Eq. 1 to obtain consistent estimates of structural probit model parameters ξ .

5.2 Evidence

The first step in the two-stage procedure is to estimate the reduced form covenant choice equation using a probit maximum likelihood method. These estimates are not reported separately in a table but the main results are similar to those from the structural probit regressions reported later. They show that proxies for bank charter value negatively affect the likelihood of covenants, consistent with more restrictions in debt issued by banks with greater risk-taking incentives. Debt issues by larger bank holding companies include fewer covenants. Covenants are negatively related to debt maturity but positively related to the presence of call and sinking fund provisions. The coefficients on time dummies are negative and significant, indicating that controlling for other debt and issuer characteristics, fewer covenants were included in debt issued in the 1980s and the 1990s. The reduced form probit model estimates are used to

generate the inverse Mills ratio, the addition of which corrects for self-selection bias in the estimated yield spread regressions. These estimates are presented next.

5.2.1 Estimates from selectivity-bias adjusted yield spread regressions

The results from the self-selection bias-adjusted yield spread regressions are reported in Table 4. The dependent variable in these regressions is the offering yield-spread. The independent variables include proxies for bank charter values, a set of debt rating dummies, the natural log of debt maturity, a proxy for bank size (the natural log of asset value), 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.

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

The results in Table 4 provide mixed evidence on how bank charter values affect yield spreads. The coefficients on the q-ratio in Model (1) regressions are negative and significant at the conventional levels for both sub-samples. This finding is consistent with the existence of market discipline and suggests that banks with greater risk taking incentives offer higher yield spreads. However, the result is sensitive to the choice of bank charter proxy. The coefficients on the demand deposit ratio in Model (2) are not significant for either sub-sample. Also no clear time series pattern exists in Models (3) and (4).

The other results in Table 4 show that yield-spreads are significantly negatively related to debt rating dummies – the higher the debt rating, the lower the yield spreads. These findings are consistent with Flannery and Sorescu (1996) who argue that effective market discipline by subordinated debtholders requires that yield spreads on bank debt be lower for higher quality debt.

The coefficient on size is negative and significant, consistent with lower default risk for debt issued by large banks. This result is consistent with weaker risk-taking incentives for larger banks. Debt market reputations are likely to be more significant for large banks, reducing their incentives to engage in risk taking (Diamond (1989) and Hirshleifer and Thakor (1990)). 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 enters with a negative and significant coefficient for the sub-sample of debt contracts without covenants, consistent with low default risk for banks with high capital ratios. The coefficient on the equity capital to asset ratio is also negative for the sub-sample of debt issues with covenants, but it is no longer significant. The coefficients on the inverse Mills ratio are generally insignificant for both subsamples, suggesting that the self-selection bias is not important.

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 in Table 4 and the corresponding independent variables, excluding the inverse Mills ratio. Four different probit models are reported in Table 5 and the expected reduction in yield spread in each model is estimated from the proper 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 subordinated debtholders disciplining 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 0.05 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.

It is noteworthy that the likelihood of including covenants in bank debt contracts is significantly positively related to the expected reduction in yield spreads with covenants, consistent with the theory that covenants are used if the yield spreads are lower than they would have been had the covenants not been used. This finding is consistent with the argument that 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 in debt offered during the 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 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 more than 0.08. Also, a one standard deviation increase in expected reduction in yield spreads from offering covenants increase the predicted probability of including covenants by over 0.20. Consistent with the previous results on the large decline in covenant use in the 1980s and 1990s, the predicted probabilities of covenants is 0.22 lower in 1981-1988 and almost 0.30 lower in 1989-1995.

In column (2) of Table 5, the ratio of demand deposits to total deposits replaces q ratio as a proxy for bank charter value. Other independent variables remain the same. The coefficient on the demand deposit to total deposit ratio is negative and significant at the 0.01 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 demand deposit ratio on 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 almost 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 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 1981-1988 dummy is significantly different than that for the 1989-1995 period 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 is 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 the variable that interacts the q ratio with the 1981-1988 dummy has the expected negative sign and is significant at the 0.10 level. By contrast, the corresponding coefficients on the q ratio and the variable interacting the q ratio with the 1989-1995 dummy are both insignificant. Tests for the equality of coefficients show that the coefficient on q is significantly different from the coefficient on q interacted with the 1981-1988 dummy (χ^2 of 5.6 with a p-value= 0.02). Also, the coefficient on q interacted with 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). In contrast, the coefficient on q is not significantly different from the coefficient on q interacted with the 1989-1995 dummy (χ^2 of 0.38 with a p-value=0.54).

The last column of Table 5 presents results from a similar specification but with the q ratio replaced by the demand deposit ratio as a measure of 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. Tests for the equality of coefficients show that the coefficient on the demand deposit ratio is significantly different from the coefficient on the demand deposit ratio interacted

with the 1981-1988 dummy (χ^2 of 17.8 with a p-value=0.00). The coefficient on the demand deposit ratio is also significantly different from the coefficient on the demand deposit ratio interacted with the 1989-1995 dummy (χ^2 of 6.5 with a p-value=0.01). However, the coefficient on the demand deposit ratio interacted with 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 probability of covenant use and q-ratio for different time periods. Consistent with the results reported in Columns (3) and (4) of Table 5, the plots show that the negative relation between 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

I now examine if covenant restriction categories themselves are sensitive to bank charter values. Are debt issues by banks with low charter values more likely to include covenants that restrict some actions but not others? This question is important because regulatory restrictions on certain bank activities weaken private incentives to monitor. 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)). To the extent regulators restrict certain activities but not others, private incentives to constrain banks on some dimensions may be greater than on other dimensions.

Results from 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 yield spreads with the covenant and the time dummies for 1981-1988

and 1989-1995.¹² 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, the q ratio has a negative and significant coefficient in the baseline specification for restrictions on debt and restriction on 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 time dummies for 1981-1988 and 1989-1995. The principal variable of interest in the second equation is the interaction term between the demand deposit ratio and the dummy for 1981-1988. The coefficient on this variable has the expected negative sign in equations predicting the likelihood of debt and dividend restrictions. However, it is once again insignificant in the equation predicting the likelihood of investment restrictions. These results suggest that during 1981-1988, a bank's incentive to take risks significantly affects the likelihood of restrictions on debt and dividends.

Tests for the equality of coefficients on q interacted with time period dummies for the restriction on debt show that the sensitivity between q and the likelihood of debt restrictions are significantly more pronounced during the 1981-1988 period. The coefficient on q is significantly different from the coefficient on q interacted with the 1981-1988 dummy (χ^2 of 5.8 with a p-value=0.02). The coefficient on q interacted with 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). By contrast, the coefficient on q and the coefficient on q interacted with the 1989-1995 dummy are not significantly different from each other.

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¹² The results are qualitatively similar when the demand deposit ratio is used as a proxy for charter value.

The tests for the equality of coefficients for the restriction of dividends provide similar findings. The coefficient on q interacted with the 1981-1988 dummy is significantly different from the coefficient on q and from the coefficient on q interacted with the 1989-1995 dummy. However, the coefficient on q is not significantly different from the coefficient on q interacted with the 1989-1995 dummy. None of the coefficient estimates for q interacted with time period dummies are different from each other for the restriction on investment equation.

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 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 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 restrictions on dividends, while restrictions on investment are negatively related to restrictions on dividends. It is likely that when a bank's performance declines, its incentives to engage in asset substitution and claim dilution become more severe. Poor performance also increases the likelihood that dividend covenants become binding. Subordinated debt which, for example, includes debt restrictions but no dividend or investment restriction may be ineffective in mitigating risk taking incentives. In addition, Smith and Warner (1979) suggest dividend covenants also constrain investment policy suggesting that some covenants may be substitutes. While a detailed examination of these complementarities and substitutabilities is left for future research, the discussion here suggests that debt contracts are designed to constrain shareholders incentives to engage in risk taking along several dimensions.

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 a better reputation 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 for them. The coefficient on the expected reduction in 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 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 are 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. Concerns that changes in capital adequacy regulations may somehow affect the results of this paper are 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, when 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. The existence of multiple issues may potentially understate the standard errors as regression residuals may be correlated with the explanatory variables. Also, the residuals from for one bank's bond issues may be correlated with one another, thus 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 the q ratio 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 by 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 regulation in the U.S. banking industry during the 1981-1988 period, suggest that moral hazard problems were more severe during this period. The results show that the sensitivity between the existence of restrictive covenants in bank debt and the bank's charter value is most pronounced during the 1981-1988 period. Overall, these results are consistent with private risk bearing replacing some direct federal supervision and monitoring during the 1981-1988 period.

These results have immediate relevance to the current debate about the market discipline of bank risk taking. First, the results show an alternative channel of debtholders discipline of 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 regulator 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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Figure 1: Plot of predicted probabilities of covenant choice (estimated from the coefficients in column (1) of Table 5) against the q-ratio, holding all other variables constant at their mean.

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

Figure 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.

Figure 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 1

Distribution of restrictive covenant categories in bank subordinated debt contracts issued by U.S. bank holding companies, 1974-1995.

The sample comprises 415 fixed-rate, nonconvertible U.S. dollar debt securities issued by 72 U.S. 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.

	1974-1995	1974-1980	1981-1988	1989-1995
<i>Panel A: Number and amount of bank debt issued</i>				
Number of debt issues	415	54	201	160
Total amount of debt issued (in millions of 1980 dollars)	43,795	6,947	20,171	16,677
<i>Panel B: Distribution of restrictive covenant categories</i>				
	Number	% of total	Number	% of total
Debt contracts with covenants	134	32%	51	94%
Restrictions on investment policy	43	10%	23	43%
Restrictions on debt	109	26%	41	76%
Restrictions on payment of dividends	54	13%	21	39%
			69	34%
			15	8%
			59	29%
			31	15%
			14	9%
			5	3%
			9	6%
			2	1%

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

	1974-1992		1970-1992		1974-1979		1970-1979		1980-1992	
	Bank debt (% of total)	Industrial debt (% of total)	Bank debt (% of total)	Industrial debt (% of total)	Bank debt (% of total)	Industrial debt (% of total)	Bank debt (% of total)	Industrial debt (% of total)	Bank debt (% of total)	Industrial debt (% of total)
<i>Restrictions on investment policy</i>										
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
<i>Restrictions on debt</i>										
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%
<i>Restrictions on payment of dividends</i>	14.6%	28.2%			42.1%	55.4%			11.5%	4.7%

Table 2

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

The sample comprises 415 fixed-rate, nonconvertible, U.S. dollar debt contracts offered by 72 U.S. 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.

Moody's bond rating	Number (percent)	Median offering yield spreads in basis points	Median total real assets (in millions of 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	2,461
Not rated	21 (5%)	106	10,435

Table 3

Debt and issuer characteristics, 1974-1995

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 1% level. ** Significant at the 10% level. * Significant at the 10% level.

	Interval of years	Mean	Median	Standard deviation	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	1,477	153,266
	1974-1980	28,392	14,020	35,772	1,842	114,920
	1981-1988	52,946***	32,067***	52,386	1,477	147,687
	1989-1995	43,870***, (*)	30,009***	36,497	2,090	153,266
Market-to- book-assets ratio (<i>q</i>)	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

Table 4

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

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 heteroscedasticity appear in parentheses below the coefficient estimates. ***, **, * indicates significance at the 1%, 5%, and 10% level, respectively.

	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 (3.0)***	7.590 (6.1)***	1.946 (0.8)	2.662 (3.3)***	-2.572 (-0.4)	8.036 (5.8)***	1.492 (0.5)	2.451 (2.9)***
q ratio	-1.464 (-1.8)*	-5.609 (-5.0)***			6.689 (0.9)	-6.219 (-4.6)***		
q ratio × 1981-1988 dummy					-7.109 (-0.8)	-0.058 (-0.1)		
q ratio × 1989-1995 dummy					-7.516 (-1.0)	0.821 (0.4)		
Demand deposits ratio			0.442 (0.5)	-1.153 (-1.5)			11.243 (3.6)***	-0.899 (-1.3)
Demand deposits ratio × 1981-1988 dummy							-13.335 (-4.2)***	-0.669 (-0.3)
Demand deposits ratio × 1989-1995 dummy							-8.715 (-2.6)***	6.104 (2.2)**

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)		
Aaa dummy	-0.722*** (-6.5)	-0.543*** (-3.2)	-0.791*** (-6.8)	-0.595*** (-3.3)	-0.817*** (-6.4)	-0.490** (-2.4)	-0.559*** (-2.4)		
Aa dummy	-0.577*** (-6.5)	-0.472** (-2.8)	-0.695*** (-6.9)	-0.361** (-2.0)	-0.678*** (-6.6)	-0.425** (-2.5)	-0.321 (-1.6)		
A dummy	-0.182 (-1.4)	-0.144 (-0.6)	-0.495*** (-3.8)	0.098 (0.5)	-0.413*** (-3.1)	-0.063 (-0.3)	0.157 (0.6)		
Log of debt maturity	-0.111 (-1.0)	0.205 (1.3)	0.091 (0.9)	0.011 (0.1)	0.022 (0.2)	0.158 (1.1)	0.003 (<0.1)		
Log of total assets	-0.141*** (-3.1)	-0.133*** (-2.9)	-0.077 (-1.6)	-0.142*** (-2.7)	-0.106 (-1.7)*	-0.148 (-1.9)*	-0.140 (-1.6)		
Equity capital/asset ratio	-19.047*** (-4.4)	-1.635 (-0.4)	-14.530*** (-3.8)	-10.792 (-2.2)**	-15.384*** (-3.7)	-2.772 (-0.6)	-10.584 (-1.6)		
Sinking fund dummy	1.156 (2.8)***	0.012 (<0.1)	0.468 (1.1)	0.272 (1.1)	0.659 (1.6)	0.113 (0.4)	0.290 (1.0)		
Call provision dummy	0.326 (1.8)*	-0.085 (-0.5)	0.003 (<0.1)	0.152 (0.9)	0.090 (0.6)	-0.015 (-0.1)	0.158 (1.1)		
Dummy 1981-1988	-0.957 (1.8)*	-0.007 (<0.0)	0.305 (0.5)	-0.610 (-1.1)	6.598 (0.9)	-0.152 (<0.0)	-0.508 (-1.1)		
Dummy 1989-1995	-1.001 (-1.6)	0.192 (0.3)	0.465 (0.6)	-0.797 (-1.1)	7.080 (1.1)	-0.903 (-0.4)	-1.993 (-2.4)**		
Inverse Mills ratio	-2.752 (-1.9)*	0.029 (<0.1)	0.475 (0.4)	-2.095 (-1.1)	-0.407 (-0.4)	-0.903 (-0.5)	-2.309 (-1.2)		
N	285	130	285	130	285	130	130		
R ²	0.29	0.41	0.28	0.28	0.28	0.41	0.34		

Table 5

Probit regressions predicting the restrictiveness of bank debt contracts, 1974-1995

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 heteroscedasticity appear in parentheses below the coefficient estimates. ***, **, * indicates significance at the 1%, 5%, and 10% level, respectively.

	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 (1.4)		1.779 (1.8)*		-0.619 (-0.1)		1.225 (1.0)	
q ratio	-4.911 (-2.4)**	-1.656			3.041 (0.4)	1.022		
q ratio $\times$ 1981-1988 dummy					-13.556 (-1.9)*	-4.555		
q ratio $\times$ 1989-1995 dummy					-1.048 (-0.2)	-0.352		
Demand deposits/total deposits			-3.381 (-3.7)***	-1.124			6.231 (1.5)	2.087
Demand deposits/total deposits $\times$ 1981-1988 dummy							-11.278 (-2.7)***	-3.777
Demand deposits/total deposits $\times$ 1989-1995 dummy							-8.462 (-1.5)	-2.834

	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	Coefficient estimate (z-stat.)	Marginal Effects	Coefficient estimate (z-stat.)	Marginal Effects
Log of total assets	-0.057 (-0.7)	-0.019	0.030 (0.4)	0.010	-0.089 (-1.0)	-0.030	-0.037 (-0.5)	-0.012				
Expected reduction in yield spread with covenants	0.867*** (3.5)	0.292	1.042*** (3.4)	0.347	0.075 (0.2)	0.025	0.646** (2.0)	0.216				
Dummy 1981-1988	-0.648 (-1.7)*	-0.219	-1.478*** (-4.1)	-0.491	11.006 (1.7)*	3.699	1.406 (1.0)	0.471				
Dummy 1989-1995	-0.968 (-1.8)*	-0.326	-2.104*** (-4.5)	-0.700	-1.747 (-0.3)	-0.587	-0.121 (-0.1)	-0.041				
N	415		415		415		415					
Model χ^2 p-value	0.000		0.000		0.000		0.000					

Table 6

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

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 heteroscedasticity appear in parentheses below the coefficient estimates. ***, **, * indicates significance at the 1%, 5%, and 10% level, respectively.

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

Appendix A

Correlations between proxies for bank charter value and restrictive covenants. p-values are reported in parentheses.

Panel A: 1974-1995														Panel B: 1974-1980													
q ratio														q ratio													
q														q													
Demand deposit/total deposit ratio														Demand deposit/total deposit ratio													
Covenant restrictiveness														Covenant restrictiveness													
Restrictions on investment														Restrictions on investment													
Restrictions on dividend														Restrictions on dividend													
Restrictions on debt														Restrictions on debt													
Panel C: 1981-1988														Panel D: 1989-1995													
q ratio														q ratio													
q														q													
Demand deposit/total deposit ratio														Demand deposit/total deposit ratio													
Covenant restrictiveness														Covenant restrictiveness													
Restrictions on investment														Restrictions on investment													
Restrictions on dividend														Restrictions on dividend													
Restrictions on debt														Restrictions on debt													

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.

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 Apr. 1, 1993 and ending at the close of business on May 1, 1993.

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.

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.

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.