

Can Financial Markets Discipline Banks? Evidence from the Markets for Preferred Stock

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Abstract

This paper explores the potential benefits of allowing greater use of money-market preferred stock (MMPS) in the capital structure of banking organizations. We find that banking organizations offering MMPS tend to have lower profitability and higher credit risk than institutions offering capital-market preferred stock. This finding is consistent with the hypothesis that markets will provide incentives, in the form of lower risk premiums, for high default-risk institutions to offer MMPS rather than CMPS, because the auction process allows investors to adjust for any shifts in risk profiles by repricing the issue every 49 days. The finding that institution-specific risk influences the financing behavior of bank managers implies that banks are subject to a degree of market discipline.

I. Introduction

A number of authors have proposed various plans for using the debt markets for the purpose of monitoring and disciplining depository institutions as discussed in Benston, et al. (1986), Wall (1989), White (1991), Barth et al. (1992) and Evanoff (1992). Although differing somewhat in detail, each of these schemes requires that depository institutions raise a substantial percentage of the capital held to satisfy the current capital requirements in the form of subordinated debt. The mechanism for applying discipline is the market's frequent opportunity to reprice these bonds - *to the issuer*. Thus, these would be primary market repricings, rather than the secondary market repricings which occur in the market for bank equity. Repricing would occur several times a year as the banks are obliged to roll over a portion of this debt. According to Wall (1989), if long-maturity bonds were issued to satisfy this requirement, they might contain put options allowing the holder to return the bond to the issuer for par value. Thus, the depository institution would be forced to either return to the marketplace to replace this capital or reduce assets.

This paper explores the potential benefits of allowing greater use of money-market preferred stock (MMPS) in the capital structure of banking organizations. The dividend on this form of preferred stock is typically reset every 49 days in an auction process. Here, we use MMPS as a general term that also encompasses instruments

referred to as auction-rate, dutch-auction-rate, and remarketed preferred stock. These securities trade at par except in the rare case when an auction fails, i.e. too few bids below a stated ceiling rate are received.¹

Subordinated debt and MMPS share many common characteristics that make them attractive vehicles for enhancing market discipline.² Like debtholders, investors in MMPS have funds at risk, but do not share in profits from high-risk activities of the issuing company.³ Thus, high-risk institutions are pressured to pay higher rates and agree to more restrictive covenants than low-risk institutions. Sharply rising rates also signal regulators that the private market's perception of the issuing institution is changing and that supervisory action may be required. An important advantage of both instruments is that unlike depositors, investors in subordinated debt and MMPS cannot quickly withdraw their funds from a bank. Therefore, the market discipline they provide does not come with the cost of an increased probability of bank runs.⁴ Like subordinated debt, MMPS provides a cushion to absorb losses after common shareholders' positions are wiped out, and therefore acts to lower the burden placed on the government insurance fund. However, unlike proposals to introduce private insurance, which would perform the same function, the government would not need to create procedures to verify private insurers' ability to perform. Nor would it be necessary to establish a legal

framework to accommodate private insurers in its closure and resolution procedures. A legal framework that establishes the rights of debtholders and shareholders already exists. Finally, allowing banks greater flexibility in using subordinated debt and preferred stock to meet regulatory capital requirements could create additional sources of capital for the banking industry.

Important differences between subordinated debt and MMPS also exist. Organizations with taxable income and a high tax rate find the deductibility of interest payments a strong incentive to issue subordinated debt over preferred stock. Conversely, organizations with low tax rates view issuing preferred stock more favorably to the extent they provide a vehicle for capturing a share of the tax benefit arising from the corporate dividend exclusion as reported in Alderson et al. (1987).

Several recent experiences of banking organizations with MMPS provide anecdotal evidence of their effectiveness in imposing greater market discipline. *The Wall Street Journal* (Nov 1, 1990, p. C18) reported that the dividend rate paid by Citicorp more than doubled on their auction-rate preferred stock in just a two month period in late 1990, reflecting investor concern over rising problem real estate loans. In late October, Citicorp paid 13%, more than double the rate of 6.03% paid by J.P. Morgan. According to the *New York Times* (Nov 8, 1990, p. D1), in November 1990, Citicorp opted to redeem \$275 million of its \$925 million MMPS outstanding rather than continue to pay the high dividend rate. Also, in November 1990, *The Wall Street Journal* (Nov 30, 1990, p. C11) reported that Wells Fargo and Security Pacific would redeem auction-rate preferred stock rather than accept sharply higher dividend rates. It is especially interesting to note that investor concern reflected in Citicorp's MMPS was not present in the markets for Citicorp's debt. A spokesman for Citicorp called the rates on MMPS "an aberration" in the *New York Times* (ibid.). Rates on their commercial paper ranged between 7.85% and 8.10% during the same period of time.

The potential economic benefits of using market discipline as a substitute for the often ineffective discipline provided by insured depositors or by regulatory oversight are generally well-recognized and are not controversial. What is the subject of continuing debate is the underlying presumption of each of these schemes - that investors in uninsured liabilities would have the *incentive* to monitor and force the closure of banks perceived to be in significant danger of insolvency. Those who are skeptical of the market-discipline schemes argue that investors do not have the incentive to 'price out' the default risk associated with the securities of large banks because of the perception that they are "too big to fail", i.e., that the

government cannot permit them to fail. In this view, the market would be ineffective in the monitoring and disciplining of large banks.

The question of whether financial markets have the incentive to effectively price the portfolio risk inherent in the securities issued by large banks is important. Previous studies have examined this issue by focusing on the markets for bank equity, subordinated debt, or uninsured deposits. The empirical evidence, to date, is inconclusive.⁵ This study takes a different approach by focusing on the markets for bank preferred stock. We do this for several reasons. First, to provide additional evidence on this issue using a set of market data not previously examined. Second, to take advantage of the fact that large banks currently issue both money-market and capital-market preferred stock, each with distinctly different default-risk characteristics. Third, because we wish to call attention to the role money-market preferred stock might play in the capital structure of banks. In summary, the objectives of this study are, (i) to provide additional evidence on the proposition that markets will discipline large banks, and (ii) to identify a role for preferred stock as an important alternative to subordinated debt.

The paper is organized as follows. The default risk hypothesis is developed in the next section, followed by a description of the methodology and the data. In the following section we provide an analysis of the test results. The final section presents our arguments for a supplementary role for preferred stock.

II. The Default Risk Hypothesis

During the 1980s banks and thrifts greatly increased their participation as suppliers of preferred stock to both the capital markets and the money markets. A recent study by Houston and Houston (1990) found that fully 30% of all preferred stock was issued by financial institutions during this period. As shown in Table 1, twenty percent of the preferreds issued by depository institutions during the period 1984-1990 were money market preferred. From an investor's viewpoint, money market preferreds compete with T-bills, commercial paper, and other short-maturity securities in the money markets. All other types of preferred stock offered by depository institutions, including various types of adjustable-rate preferred, trade in the long-maturity capital market.

The investment characteristic that distinguishes MMPS from capital market preferred stock (CMPS) is their relatively shorter holding period between repricings.⁶ This distinguishing characteristic not only affects the markets in which these instruments are traded, but it also leads to differences in default risk characteristics.⁷

Longer forecasts of the default risk characteristics of the issuing institution are more uncertain than short forecasts from an investor's viewpoint - hence riskier. Quite simply, a 49-day gamble is less risky than an indefinite gamble. The auction process every 49 days gives investors the opportunity to reassess the risk profile of the issuing institution, to revise prior estimates of the probability of default, and gives them the option of repricing the risk premium through the dividend resetting process. Because the repricing option has value, the default risk premium associated with CMPS will be greater than that associated with MMPS, *ceteris paribus*. Moreover, it is likely that this disparity in default risk premiums (MMPS versus CMPS) will be greater for firms with higher than average default risk. Thus, we hypothesize that the incentive to issue MMPS versus CMPS will be positively associated with the issuing firms default risk. Note that, in effect, this is a joint hypothesis. It posits that markets price out the default risk of large banks *and* that bank managers respond to these pricing incentives.

A depository institution's default risk is a qualitative or judgmental variable. An investor's judgment of default risk are influenced by a number of publicly disclosed variables that, taken together, form a picture of the firm's financial health. Put another way, default risk assessments are influenced by the (publicly disclosed) variables most closely associated with the probability of failure. The most important variables, in this regard, are likely to be measures of solvency, asset credit risk, and profitability. Thus, to operationalize the default risk hypothesis, we posit that MMPS issuers will tend to be less solvent, have greater asset credit risk, and be less profitable than CMPS issuers.

III. Methodology and Data

The hypothesis is tested using statistical tests of differences which relate the type of preferred stock issued (CMPS or MMPS) to measures of the issuing firms' solvency, asset credit risk, and profitability. A sample of 152 issues of preferred stock was identified in the National Automated Accounting Research System (NAARS) database.⁸ The data were collected from the financial reports of depository institutions which reported issuing preferred stock during fiscal years 1984-1990 (period ending June 1991). The NAARS database was selected because it contains not only the financial statements, but also the full text of the related footnotes. Data on the specific characteristics of each preferred stock issue were hand-collected from these footnotes. In this regard, NAARS has a richness of detail other databases lack. Also, in contrast to data published by other sources such as the SEC which list only public, cash offerings of preferred stock, data in NAARS includes both cash and exchange offerings, and both public offerings and private placements.

Recent trends in the financial industry's use of preferred stock are shown in Table 1. In the first panel, the sample is partitioned on the basis of market type, i.e., into MMPS and CMPS. Of the 152 issues in the sample, 30 (20%) were money-market issues and 122 (80%) were capital-market issues. The 30 money market instruments were issued by 26 banking organizations.

In the second panel, the entire sample is again partitioned, this time on the basis of fixed versus variable dividends. Here the term "variable dividend" is used,

TABLE 1.
Distribution of 152 Issues of Preferred Stock by Depository Institutions:
1984-1990.

Year	Market		Dividend		Total
	MMPS ^a	CMPS ^b	Fixed	Variable ^c	
1984	0	36	21	15	36
1985	6	20	14	12	26
1986	7	14	9	12	21
1987	9	17	9	17	26
1988	2	9	7	4	11
1989	4	12	6	10	16
1990	2	14	9	7	16
Total	30	122	75	77	152

a. Money market preferred stock.

b. Long-maturity preferred stock traded in the capital market.

c. Includes both money-market and adjustable-rate preferred stock.

collectively, to refer to all preferred stocks with a dividend rate re-setting mechanism, either an auction, or a mechanism for pegging the dividend to an index.⁹ Fixed-dividend and variable-dividend preferreds account for 49% and 51% of the sample, respectively. Interestingly, the substantial amount of adjustable-rate preferred stock (initially introduced in 1982) and dutch-auction preferred stock (initially introduced in 1984) have not detracted from the continuing use of fixed-dividend preferred stock over this period. The data indicate that depository institutions make approximately equal use of fixed-dividend versus variable-dividend preferred.

Only relatively large institutions issue MMPS. The smallest organization participating in this market over our sample period had assets of \$1.2 billion at the time of issue. To avoid obscuring the analysis with comparisons of institutions vastly different in size, the comparisons of issuers of MMPS with issuers of CMPS are restricted to those institutions with at least \$1 billion in assets. This reduces the number of CMPS issuers to 89. This data adjustment does not change our conclusions in any substantial way.

IV Test Results

Table 2 provides two tests of difference for a number of variables associated with the choice of issuing CMPS versus MMPS. The variables are arranged in descriptive groupings such as size variables, profitability variables, etc. The first two columns contain the means and medians for all MMPS and all CMPS issuers, respectively. The third and fourth columns contain the t-statistic for the difference of means test and the Kruskal-Wallis (K-W) H statistic.

The t-test provides a test of the proposition that the samples are drawn from populations with different means. The Kruskal-Wallis (K-W) analysis tests the proposition that one of the sampled populations tends to furnish greater observed values than the other sampled population (versus the null hypothesis that the populations are identical). The K-W test provides a test of the more interesting proposition and is usually more powerful than the t-test when assumptions of normality are violated. The large differences between the means and medians for most of our variables (see Table 2) are indicative of departures from normality. Although we report both the results of t-tests and K-W tests in the interest of completeness, the discussion to follow is based primarily on the results of the K-W test.

The data show that MMPS issuers are, on average, significantly larger than CMPS issuers, both in terms of total assets and total deposits. The median value is several

times greater for MMPS issuers for both of the size variables, and the K-W tests on both size measures are significant at the 10% level. MMPS issuers are also less profitable than CMPS issuers based on three separate measures of profitability; (1) net income/total assets, (2) net income/equity and (3) net interest income/total assets. The median values of all three measures are less for MMPS issuers. The K-W tests are significant at the 10% level for net income/equity and for net interest income/total assets. These results support the default risk hypothesis. In terms of solvency, measured as either book equity/total assets or market equity/total assets, MMPS issuers are somewhat more solvent. The t statistic indicates that the means of market value/total assets are statistically different, and opposite in direction to that predicted. However, the K-W statistic is not significant for this variable, nor are either of the test statistics for book equity/total assets.

Four common measures of asset credit risk are reported in Table 2. Reserves for credit losses/total assets is a forward-looking measure that represents management's estimate of loans which will not be collected in the future. Since management has superior information regarding the likelihood of loan collection, it provides outsider investors with otherwise unavailable information. Further, the reserve for credit losses is subject to examination by independent examiners who can require management to alter the reserve to conform to the estimates made by the independent examination (audit). Because the reserve allowance reflects not only the superior information of management but also the assessment of independent examiners, it is arguably the most useful and relevant measure of asset credit risk.

Another measure of asset risk is nonaccruals/net loans. This represents the proportion of loans in a depository institution's loan portfolio upon which interest is no longer accruing. Some depository institutions describe these as "cash basis" loans, as no interest can be recorded until received because the likelihood of receiving payments has dropped so low. Since nonaccruals represent loans for which payments have already ceased, they represent a measure of known asset credit risk; they thus comprise an incomplete measure when compared to the reserve for loan losses.

The third measure of asset risk used is net chargeoffs/net loans. This provides a measure of loans which have been charged off or written off as uncollectible. Per se, they represent management's estimate of loans which are currently deemed unrecoverable and hence no longer viewed as an asset or loan. To the extent that past charge offs are a good proxy for future charge offs, this measure presents an alternative means of measuring future asset

TABLE 2.
Difference Tests: CMPS versus MMPS

Variable	Mean ^a (Median)		t-stat	K-W Test ^b
	MMPS	CMPS		
SIZE				
Total Assets	\$32,822 (\$19,106)	\$24,020 (\$8,755)	-1.04	3.41#
Total Deposits	\$22,237 (\$14,241)	\$15,923 (\$6,479)	-1.10	3.66#
PROFITABILITY				
Net Income / Total Assets	0.13 (0.55)	0.36 (0.63)	1.06	2.11
Net Income / Equity	1.85 (7.80)	1.59 (10.09)	-0.03	2.77#
Net Int Income / Total Assets	2.43 (2.65)	2.94 (3.12)	2.07*	2.91#
SOLVENCY				
Book Equity / Total Assets	7.23 (7.18)	6.64 (6.90)	-1.36	1.46
Mkt Equity / Total Assets	7.26 (4.84)	4.19 (3.49)	-1.90#	1.05
ASSET CREDIT RISK				
Nonaccruals / Net Loans	2.75 (2.69)	2.58 (2.00)	-0.32	0.62
Net Chargeoffs / Net Loans	1.10 (0.92)	0.90 (0.58)	-0.91	1.96
Reserves Credit Losses / Total Assets	1.47 (1.13)	1.04 (0.86)	-2.15*	4.60*
Interest Foregone / Gross Int Inc	1.64 (1.52)	1.55 (1.20)	-0.24	1.20
USE OF FUNDS				
C & I Loans / Net Loans	40.21 (42.65)	39.47 (40.73)	-0.16	0.02
RE Loans / Net Loans	27.33 (22.32)	32.03 (24.53)	0.83	1.47
Earning Assets / Total Assets	94.44 (95.06)	94.52 (95.43)	0.10	1.26
LIQUIDITY				
Treas Sec + Cash / Total Deposits	26.19 (22.80)	24.02 (23.44)	-0.65	0.01
Net Loans / Total Assets	57.70 (63.67)	61.17 (61.89)	1.15	0.00
LIABILITY				
Coef Var: Qtly Net Int Income	0.05 (0.10)	0.14 (0.12)	1.15	0.62
Coef Var: Qtly Net Income	-10.55 (0.41)	4.25 (0.33)	1.49	0.23
Coef Var: Qtly Prov Loan Losses	0.83 (0.79)	0.66 (0.52)	-1.43	2.63
GROWTH				
%CHG: Total Assets	10.29 (8.62)	16.66 (11.83)	1.15	2.12
OTHER				
Tax Rate	33.18 (19.75)	17.70 (16.52)	-1.77#	0.50

a - Means and medians are shown as percents except for total assets and total deposits which are in millions of dollars.

b - Test statistic for the null hypothesis that the distributions of the variable for the two groups are the same. The Kruskal-Wallis H statistic is based on the sum of ranks of each group and follows an approximate chi-square distribution.

* - indications statistical significance at the 5% level, and # indicates statistical significance at the 10% level.

credit risk. However, under volatile economic conditions, the relationship between past and expected charge-offs becomes unpredictable, lessening the reliability of this measure.

The final measure, interest foregone/gross interest income is a measure of the opportunity loss suffered by the bank as a result of renegotiated or restructured loans. When such renegotiations or restructurings involve an interest rate concession by the depository institution, the institution are forgoing some portion of interest agreed to under the terms of the original terms of the loan. Interest actually reflected in the financial statements is based on the lower, renegotiated interest rate; interest lost or foregone is not considered either as an income or an expense item. Instead, financial institutions must disclose the economic impact of this aspect of the restructuring activities during the year in the footnotes to the annual report. Because it relates only to the renegotiated or restructured loans, it is admittedly a partial measure of the opportunity loss. While a more complete measure might be constructed using estimates of the impact of loans 90 days past due or nonaccrual loans, firms only disclose the interest foregone as a result of renegotiated loans leading to use of the partial measure in this analysis.

As predicted, the means and medians of all four asset credit-risk measures are greater for MMPS issuers than CMPS issuers. However, only one of the measures are significantly different. Reserves for credit losses/Total assets - which we have argued is the best measure of asset credit risk - is significant at the 5% level. Taken as a whole, we find the results of the credit-risk measures supportive of the default risk hypothesis.

Table 2 also provides comparisons of various liquidity and stability measures, plus growth in terms of percent change in total assets, and reported tax rates. None of these measures are statistically significant. Altogether, we interpret the results on the key profitability, solvency, and asset credit risk measures as providing moderate support for the default-risk hypothesis.

V Regulatory Implications: the Role of Money Market Preferred Stock

Recent developments in capital structure theory indicate that it would be rational for value-maximizing firms with below-average expected tax rates to issue preferred stock in preference to debt. Driving this theory is the fact that a majority of the dividend income received by corporate investors is exempt from taxation. Fooladi and Roberts (1986) formally demonstrate that in a Miller (1977) equilibrium, firms with low tax rates will be induced to issue preferred stock to corporate investors with high tax

rates which can take advantage of the dividends-received deduction. This inducement takes the form of a lower before-tax current yield on preferred stock than would be required of equally risky corporate debt. For example, high-quality dutch-auction-rate preferred stock yields are typically less than 80% of the rates on commercial paper of similar duration and quality. For issuing firms with sufficiently low tax rates, this "pass-through" tax benefit in the form of a rate reduction outweighs the interest tax shield forgone by issuing preferred rather than debt. Elmer (1988) extends the analysis of preferred stock in a Miller equilibrium by demonstrating that preferred stock is a potentially attractive financing alternative for firms with tax rates less than 0.8 of the aggregate expected corporate tax rate. Both studies imply that firms with below-average expected tax rates will have an incentive to sell preferred stock to a tax clientele of firms with above-average tax rates.


Houston and Houston (1990) provide a test of this theory. Their evidence strongly supports the tax hypothesis of preferred stock issuance across all major industry groups, including financial institutions. Of 255 issues of preferred stock made by financials, they found that 212 (83%) were made by institutions with effective tax rates below the market median. These results are significant at < 0.0001 and, in addition to supporting the tax hypothesis, provide evidence of value-maximizing behavior on the part of bank managers.

Our conclusion is that any future regulatory requirement that banks issue subordinated debt should be expanded to include MMPS as an alternative. There is no evidence to indicate that MMPS investors would be different from subordinated debt investors in their risk-pricing behavior. Indeed, one would expect that they might be even more diligent in applying discipline because of their inferior claim relative to debt in any 'work out' procedure resulting from financial difficulties. Most importantly, however, both capital market theory and available empirical evidence imply that the lack of a preferred stock alternative would adversely impact bank value for institutions with below-average expected tax rates.

VI Suggestions for Future Research

This empirical study of financing behavior finds that a depository institution's asset credit risk and profitability are associated with the choice between issuing money-market preferred stock (MMPS) and capital-market preferred stock (CMPS). Banking organizations offering MMPS tend to have lower profitability and higher credit risk than institutions offering CMPS. This finding is consistent with the hypothesis that markets will provide incentives, in the form of lower risk premiums, for high

default-risk institutions to offer MMPS rather than CMPS, because the auction process allows investors to adjust for any shifts in risk profiles by repricing the issue every 49 days. The finding that institution-specific risk influences the financing behavior of bank managers implies that banks are subject to a degree of market discipline. A number of proposals to reform the federal deposit insurance system have been made that would expand the role of private markets in constraining risk-taking activities of banks and increase the size of the private capital cushion available to absorb losses. One such approach would require banking organizations to maintain a specified level of regulatory capital in the form of subordinated debt. Our recommendation is that any future change in regulatory capital that encourages greater use of subordinated debt be expanded to include money-market preferred stock as an alternative.

Research in two specific directions is needed to support this policy action. First, the standards for capital adequacy have changed since the time period of our study. The Basel Agreement implemented risk-based capital ratios and extended capital requirements to off-balance-sheet activity. The FDIC Improvement Act of 1991 removes some discretion from the banking regulatory agencies by requiring prompt corrective action against undercapitalized institutions. Research is needed to ascertain if our results are robust with regard to changing capital regulatory environments. Second, analysis on the access of banks to the various preferred-stock markets would be valuable to policy makers. The banks in our sample are relatively large. Are there impediments to smaller institutions issuing MMPS? Would a greater acceptance of these types of financial instruments as legitimate forms of capital by regulators promote further development of these markets and consequently remove significant impediments that now deny small banks access to them? Research on these questions would help determine if the benefits of issuing money-market preferred stock could be extended to a wide range of banks or if they are limited to only the very largest banking organizations. 

*** Endnotes ***

1. See Alderson, et al (1987) for an explanation of the mechanics of the dutch-auction process. See Schnaidman and Toscano (1990) for a comparison of dutch-auction preferred stock with other recent capital innovations.
2. See Benston et al (1986), Evanoff (1992), and White (1991) for greater elaboration of why requiring banks to issue subordinated debt would enhance market discipline.
3. This assumes that net worth has not fallen so low that closure is probable. In this environment, preferred stock and subordinated debt will behave like common stock.
4. This feature represents an important advantage of proposals calling for greater use of subordinated debt over options that limit the federal deposits insurance safety net. Schemes that would lower federal insurance coverage in some way could prove effective in enhancing market discipline, but might also lead depositors to more frequently make withdrawals out of fear for the safety of their deposits.
5. See Gilbert (1990) for summaries of this literature which includes studies by Baer and Brewer (1986), Hannan and Hanweck (1988), Avery, Belton, and Goldberg (1988), Gorton and Santomero (1990).
6. The dividend on adjustable-rate preferred stock is also frequently reset. However, even when repricing occurs as frequently as every three months, this is significantly longer than the 49-day period of MMPS. The time difference would be significant to money managers who intend to hold the instrument just 46 days to meet the dividend exclusion rule.
7. There may also be differences in call risk according to Winger, et al. (1986). The focus here is on default risk.
8. From an original population of 155 issues, two were eliminated for lack of data and one because the issuing institution had a very high proportion of non-banking activities.
9. Partly because of proprietary trade marking by investment banking organizations, there are numerous acronyms for variable-dividend preferred stock. Included in this rubric are ARPS, DARPS, DARTS, MMP, RAPS, SABRES, SPARS, STARS and STRAPS.

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