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Michael C. Keeley

The Stock Price Effects of
Bank Holding Company Securities Issuance

Frederick T. Furlong

Commodity Prices as a Guide for
Monetary Policy

Bharat Trehan

Forecasting Growth in Current Quarter Real GNP

Carolyn Sherwood-Call

Undocumented Workers and Regional
Differences in Apparel Labor Markets

The Stock Price Effects of Bank Holding Company Securities Issuance

Michael C. Keeley

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This paper examines the announcement effects of bank holding company (BHC) securities issuance on their common stock prices. A key finding is that since December 1981 when objective minimum capital regulations were put into place, announcements of common stock issuance have been associated with statistically significant negative abnormal common stock returns for BHCs under regulatory pressure to boost capital. No such effects were found for highly-capitalized BHCs that were not under regulatory pressure to boost capital. These results suggest that poorly-capitalized BHCs will be reluctant to issue common stock to meet capital requirements. They also suggest that the deadweight costs associated with common stock issuance by well-capitalized banking organizations are small or nonexistent.

Bank and bank holding company (BHC) capital regulation is becoming an increasingly important tool to limit banking risk. More capital relative to assets provides a greater cushion to absorb losses. Moreover, as Furlong and Keeley (1987a, 1987b) show, more capital relative to assets reduces banks' incentives to increase asset risk. Thus, an increase in BHCs' capital-to-asset ratios should reduce the risk exposure of the deposit insurance system.¹

Capital regulation was strengthened² in December 1981 when specific bank and bank holding company minimum capital standards were introduced for the first time, a departure from the previous subjective peer-group type of capital regulation. In addition, these minimum capital requirements were modified in 1983 to include the multi-national bank holding companies and again in 1985 to standardize the minimum requirements for all banks and bank holding companies.³

In early August 1988, the Board of Governors adopted an even more stringent set of "risk-based" capital requirements for BHCs based on an international agreement among the twelve leading industrial countries. These new standards represent an important departure from the current ones in that they require different amounts of capital based on an assessment of an asset's risk class. They also require capital to be held against off-balance-sheet items. Finally, they require more capital for assets in the highest risk class than do current standards and also define capital differently than the current U.S. rules do.

To meet these new capital-to-asset ratio requirements, many banks and bank holding companies either will have to sell assets or increase capital by retaining a higher proportion of earnings and/or raising external capital. BHCs raise external capital by selling a range of different types of securities, including common stock, preferred stock, mandatory convertible debt, convertible debt, and straight subordinated debt.

Ideally, capital regulations should be designed to attain a given degree of risk exposure of the deposit insurance system while minimizing the deadweight costs imposed on the banking organizations subject to the regulations. This paper examines the stock market's reaction to BHCs' securities issuance to learn more about the effects of capital regulation on the banking firm. Specifically, the effects on BHCs' stock prices following the announcement

of the issuance of different kinds of securities may reveal whether increasing capital imposes costs on banking organizations and whether increasing capital reduces the risk exposure of the deposit insurance fund.

Two novel aspects of this study are its focus on the differences between the stock price effects for BHCs under regulatory pressure to augment capital and those that raise external capital voluntarily, and its analysis of the changes in these effects after the new specific, objective minimum capital regulations were instituted in December 1981. I find statistically significant negative stock price effects associated with common stock issuance for banking organizations under regulatory pressure to augment capital and

positive, but not statistically significant effects for other BHCs. Thus, unlike some studies that argue that announcement effects should be absolutely smaller for BHCs that are known to be under close regulatory scrutiny, I find just the opposite.

This study is organized as follows. Section I reviews the theory and evidence regarding the effects of securities issuance by nonbank firms and discusses the implications for BHCs' securities issuance. Section II reviews the prior studies of BHC securities issuance. Section III discusses the methodology and data employed in this study and Section IV presents the results. Section V presents a summary and conclusions.

I. Theory and Evidence from Nonbanking Firms: Implications for Bank Holding Companies

There is now an extensive literature regarding the valuation effects of securities issuance by industrial and utility firms. Modigliani and Miller (1958) have shown that in competitive markets without distortions, such as taxes, bankruptcy costs, agency costs, and asymmetric information, a firm's capital structure is irrelevant. If so, securities issuance should not affect a firm's stock price.⁴

However, as Smith (1986) points out, empirical studies have found statistically significant negative stock price effects of common stock issuance by industrial firms of approximately -3.14 percent, as well as negative significant effects associated with the issuance of preferred stock and bonds that are convertible into common stock. No statistically significant effects are found for other types of securities, although usually the point estimates are negative. Utility firms also have negative, but much smaller, announcement effects associated with common stock issuance, averaging about -.75 percent.

In an attempt to explain these empirical findings, theory has developed along two main lines. One argues that the existence of such distortions as taxes, bankruptcy costs, and agency costs means that capital structure does matter and that securities issuance will affect stock prices. The other line of reasoning relies on information asymmetries and signalling. Below, these two types of theories are discussed.

Capital Structure Theory

Although firms may indeed have optimal capital structures, it is unclear whether the existence of optimal capital structures could explain the negative stock price effects associated with common stock issuance by industrial and utility firms. The reason is that voluntary securities issuance should always represent a movement toward (and cer-

tainly not away from) a firm's optimum capital structure. As a result, the effects of a voluntary securities issuance (which affects capital structure) should be positive or zero.

Thus, while capital structure theory might be able to explain the negative effects of involuntary securities issuance, it seems unlikely that it could explain the negative effects associated with voluntary securities issuance. As a result, most of the literature has focused on signalling theories to try to explain the stock price announcement effects of securities issuance.

Signalling Theories

A variety of signalling theories have been built on the premise that management has information about the value of a firm that is not available to outside investors. Thus, the announcement of a security issuance is taken by investors as a signal that reveals at least some of management's inside information.

For example, Miller and Rock (1985) argue that net new external financing is a signal of lower earnings because internal financing would be used if earnings were sufficient. However, this argument implies that all types of external financing should have negative announcement effects and thus fails to explain the different effects of different types of securities issuance.

Myers and Majluf (1984) argue that management has an incentive to issue new stock when they believe the firm's stock is overvalued. However, investors realize that the firm's managers have such an incentive and take the information of a new stock issuance as a signal that the firm's stock is overvalued, which in turn causes the stock's price to fall.

This theory can explain why managers would be reluctant to issue new stock even to fund positive net present

value opportunities. If the manager knows that the firm's stock is *undervalued*, it would not be optimal to issue securities to fund a new project that had a modest positive net present value. It also would explain a preference for internal financing as well as for the use of low-risk securities, the values of which do not strongly depend on the firm's value.

However, as Dybvig and Zender (1988) point out, investors would anticipate the tendency to pass up profitable new projects and would pay a lower initial offering price than if managers could somehow be induced to follow an optimal investment policy. (That is, if initial investors could be certain managers always would undertake positive net present value projects, they would be willing to pay more for the stock at the initial offering.) Dybvig and Zender go on to show that an optimal contract for managers can be devised to overcome the underinvestment problem.

Nonetheless, Dybvig and Zender show that even with optimal managerial contracts, the existence of information asymmetries between a firm's managers and its investors will cause investors to treat securities issuance as a signal. When the manager has good news about both the new and old projects, internal financing can and will be used to undertake new projects so that lack of need for external financing will be viewed as a positive signal. Similarly, when a manager has good news about a new project and bad news about an old project, debt is issued, which has a minimal effect on stock prices. However, when the manager has bad news about both the new and old projects, equity will be issued, providing a negative signal, which causes the stock's price to fall.

In sum, even though the Myers and Majluf story may be incomplete, securities issuance probably conveys information about the performance of the existing assets of the firm as well as the prospects for new projects. Thus, it seems most likely that stock issuance is some sort of signal.⁵

Implications for Bank Holding Companies

It seems likely that signalling theory would apply to securities issued by BHCs, as well as by nonbanking firms. However, effects for BHCs might differ from those of industrial firms because BHCs are so highly regulated.

The most common argument regarding the effects of regulation is that the market's knowledge of regulatory policy reduces the information that otherwise would be revealed by a security issuance. For example, the stock

price effects associated with announcements of utility firms' common stock offerings are on average absolutely smaller than those for industrial firms. Utility firms' tendency to make repeated stock offerings (due to regulation) and the fact that utilities' stock offerings often require prior regulatory commission approval appear to diminish the information content of actual announcements and thus may explain why utilities have smaller absolute stock price announcement effects than industrial firms.

Likewise, the information content and stock price announcement effects of BHCs' securities issuance might be smaller (in absolute value) than those for nonregulated firms, even though a BHC need not obtain prior regulatory approval to issue new securities. The market's knowledge of the BHC regulatory process might well dilute the information content associated with a BHC's security offering, particularly for organizations known to be under regulatory pressure to boost capital. Moreover, since BHC capital regulation shifted to objective, minimum standards beginning in 1981, one would expect smaller absolute stock price effects during the post-1981 period.

On the other hand, there are several reasons why the stock price announcement effects associated with BHCs' securities issuance might be *more negative* than those of industrial firms. First, if the value of the deposit insurance guarantee is capitalized in a BHC's common stock value, a security issuance that is forced on a BHC by its regulator in an effort to diminish the risk exposure of the deposit insurance fund could lead to a larger negative effect because such an issuance would diminish the (option) value of the deposit insurance guarantee. In particular, one would expect BHCs with low capital positions to experience larger negative announcement effects than would highly-capitalized BHCs.⁶ Similarly, a regulatory-induced increase in capital could result in larger negative announcement effects because distortions such as taxes or agency costs could make a forced change in capital structure away from the BHC's private optimum costly.

One final reason that the announcement effects for BHCs may be more negative than those for industrial and utility firms is that regulators may have inside information obtained during bank and bank holding company examinations. Thus, a securities issuance by a BHC known by the market to be under regulatory pressure to augment capital might convey information about the firm's earning prospects.

II. Previous Empirical Research on BHC Securities Issuance

Since there are theoretical arguments both for larger and for smaller announcement effects for BHCs' securities issuance than for industrials', the question regarding which forces dominate is basically an empirical one. Thus, in this section the available empirical studies are reviewed. There are several unpublished papers dealing with the effects of bank holding companies' securities issuance. These are papers by Isberg and Brown (1987), Wansley and Dhillon (1987), Wall and Peterson (1988), and Polonchek, Slovin, and Sushka (1987).

Isberg and Brown

Isberg and Brown (1987) argue that for the 1981 to 1985 period,⁷ new common stock issues were the only type of security issuance associated with statistically significant negative common stock returns for BHCs both above and below the contemporaneous capital standards. Although two-day cumulative average prediction errors and Z statistics are not reported, it appears that they found a -1.1 percent effect for BHCs meeting the capital standards and a -2.0 percent effect for BHCs below the standards. However, since many BHCs issued capital *prior* to the implementation of new capital standards to be in compliance, it appears that many of the events characterized by this study as common stock issues by BHCs above the *current* standards were really issues intended to bring the holding company into compliance with expected future standards.

Wansley and Dhillon

Wansley and Dhillon (1987) examine the valuation effects of six types of securities issuance by BHCs between 1978 and 1985: common stock, preferred stock, convertible preferred stock, straight debt—non-shelf, straight debt—shelf, and debt-for-equity swaps. They find statistically significant abnormal returns for common stock of -1.5 percent, significant positive returns for preferred stock of 0.8 percent and no significant abnormal returns for other types of securities issuance. Since their estimate of the size of the announcement effect associated with common stock issuance is much smaller than that found for industrial firms, they argue that banking regulation, like utility regulation, reduces the uncertainty and information content of new securities issuance and therefore reduces the absolute size of the stock price announcement effect.⁸

Wall and Peterson

Wall and Peterson (1988) examine the valuation effects of common stock, preferred stock, convertible debt, man-

datory convertible debt, and subordinated debt issuance by BHCs from 1982 through 1986. One innovation of their study is that they obtain the announcement day from the Dow Jones News Service instead of the *Wall Street Journal Index* as the other studies do. They argue that this allows them to pinpoint the actual first trading day that would be affected by the announcement. (Thus, they use only a one-day event period.) They find a statistically significant -1.5 percent abnormal return for common stock issuance, but no significant effects for other types of securities issuance.

Polonchek, et al.

Finally, Polonchek, Slovin, and Sushka (1987) follow a methodology that is closest to that of this paper. They examine the valuation effects of various types of securities issuance for the 1975 to 1985 period and distinguish the pre-1981 period from the post-1981 period. They also distinguish the effects for multinational BHCs from those for other BHCs.⁹

They find statistically significant negative abnormal returns for common stock issuance prior to December 1981 (-1.7 percent) but not for any other types of securities.¹⁰ After December 1981 abnormal returns also are negative (-1.1 percent) but are not statistically significant. Even though the absolute decline in abnormal returns appears not to be statistically significant, they argue that the explanation for the decline is that during the post-1981 period, capital decisions were determined more by regulatory factors and thus contained a smaller (negative) information component.

They also find larger negative point estimates for multinational BHCs' issuance of common stock during the 1982-1984 period than for those of other BHCs (-1.9 percent for multinationals versus -0.8 percent for others), but it appears that the difference is not statistically significant. They argue that this apparent pattern arises because the multinationals were not subject to capital requirements until 1983. However, the main reason that the multinationals were not subject to capital requirements until 1983 is that none of these banking organizations would have met the 1981 requirements in December 1981 (see Keeley [1988]). That is, they were given time to raise capital and bring themselves into compliance. This suggests that the multinationals were, in fact, under regulatory pressure to boost their capital by a large amount. Since the multinationals actually were under severe regulatory pressure to raise capital to meet the 1983 and 1985 standards before

those standards took effect, the evidence that their abnormal returns were larger (in absolute value) than those of other BHCs actually contradicts the hypothesis that regulation would cause abnormal returns to decline in absolute value.

Summary

On the whole, these studies support the hypothesis that there are negative announcement effects associated with common stock issuance by BHCs. The absolute values of the effects for BHCs appear to be smaller than those found for industrial firms but larger than those found for utilities. Although these results are broadly consistent with the hypothesis that BHC regulation dilutes the information content of securities offerings (since the absolute sizes of the BHC effects are smaller than those for industrial firms),

they are not inconsistent with a number of other hypotheses. Moreover, these results tell us little about which aspects of the regulatory process may account for the smaller stock price effects.

With the exception of Polonchek, Slovin, and Sushka, none of the papers tries to distinguish the announcement effects before and after the December 1981 change in capital regulation. Similarly, none of the papers tries to distinguish the announcement effects for BHCs that had to issue capital to meet the guidelines from those that did not, although Isberg and Brown do compare the results based (apparently) on *contemporaneous* compliance with capital guidelines. Moreover, none of the papers distinguishes the effects before and after December 1981 for BHCs that would have met the guidelines from those that would not have.¹¹ In the analysis below, I address these issues.

III. Methodology and Data

This paper employs the market model to estimate the abnormal stock price returns associated with BHCs' securities issuance. The model is estimated with data on each BHC's daily stock returns for a 60-day period beginning 80 trading days before and ending 20 trading days before the announcement of each security issuance in order to provide a forecast of what the stock's returns would have been absent the announcement of a security issuance. (A stock's rate of return is defined as the change in the stock's price plus dividend payments, if any, divided by the original stock price.) Then estimates of abnormal stock price returns around the announcement date of securities issuance are computed as the difference between the actual and predicted value.

The market model is:

$$R_{jt} = a_j + b_j R_{mt} + e_{jt} \quad (1)$$

where:

R_{jt} = rate of return on BHC j 's common stock over period t ,

R_{mt} = rate of return on the CRSP value-weighted market index over period t ,

a_j, b_j are coefficients for BHC j ,

e_{jt} = the error term for BHC j at time t , and

t is a time index in event time, that is, $t = 81$ is the announcement date.

The prediction error for firm j on event day t is defined as:

$$PE_{jt} = R_{jt} - (\hat{a}_j + \hat{b}_j R_{mt}), \quad (2)$$

where the symbol " $\hat{\cdot}$ " denotes an estimated value.

The daily prediction errors can be averaged over events of a particular type (for example, common stock issuance) to produce daily average prediction errors:

$$APE_t = (1/N) \sum_j PE_{jt}, \quad (3)$$

where N is the number of events in the sample category. Tests of statistical significance are based on standardized prediction errors (see Mikkelsen and Partch [1986]). Each standardized prediction error (SPE_{jt}) is defined as

$$SPE_{jt} = PE_{jt} / S_{jt} \quad (4)$$

where

$$S_{jt} = \{V_j^2 [1 + 1/M + (R_{mt} - \bar{R}_m)^2 / \sum_i (R_{mi} - \bar{R}_m)^2]\}^{1/2} \quad (5)$$

V_j^2 is the residual variance of firm j 's market-model regression, M is the number of days in the period used to estimate the market model (60 days), the summation over index i indicates summation over the period used to estimate the market model, and \bar{R}_m is the mean market return over the estimation period. The average standardized prediction error is:

$$ASPE_t = (1/N) \sum_j SPE_{jt}. \quad (6)$$

Assuming the individual daily prediction errors are normally distributed, each SPE_{jt} is distributed Student t. If the individual prediction errors are cross-sectionally independent, the following Z statistic is asymptotically distributed unit normal under the hypothesis that the average standardized prediction error equals zero:

$$Z = \sqrt{N} (ASPE_t). \quad (7)$$

The empirical analysis focuses on abnormal returns associated with the announcement of a security issuance. Abnormal returns are defined as the sum of the prediction errors for the day preceding and the day the announcement is reported. This procedure allows for the possibility that the announcement may have been made during trading hours the previous day and then reported the next day.

To test the hypothesis that the two-day prediction error averaged over N events (in a given category) is zero, I compute the average two-day standardized prediction error:

$$AISPE_{t-t_0, t_0} = (1/N) \sum_j \sum_{t=-1}^0 SPE_{jt} / \sqrt{2} \quad (8)$$

and thus the Z statistic is:

$$Z = \sqrt{N} (AISPE_{t-t_0, t_0}). \quad (9)$$

Data on the returns of each BHC's security and the overall market's returns are from the Center for Research on Securities Prices (CRSP) daily returns tapes. Data on securities issuance are from Irving Trust's *Capital Securities Issued: Commercial Banking* for the 1977 through 1986 period. Data from Compustat also are used to identify the quarters when major securities issues took place.

The announcement date is defined as the date of the first report of a security issuance in the *Wall Street Journal* or the SEC registration date, whichever was first. Announcement dates were obtained by searching the *Wall Street Journal Index* for the year of and the year before the actual issuance. The assumption is that the market generally only becomes aware of a security issuance after it is formally announced or that the probability of a security issuance increases upon a formal announcement. Security issues not reported in the *Wall Street Journal* were not included in the sample.

IV. Results

Dollar Volume of Securities Issuance

Charts 1, 2, and 3 plot the dollar value of debt, common stock, and preferred stock issued by all BHCs included in Irving Trust's publication. Since this publication includes many very small issues, including those of small holding companies, it appears to be a fairly complete account of publicly-traded BHCs' securities issuance. Charts 1, 2, and

3 generally show increased security issuance in response to capital regulation.

Chart 1 shows that the dollar volume of debt issued increased greatly following the change in capital regulation in December 1981. Since subordinated debt counts as total capital and mandatory convertible debt counts as primary capital, the large rise in debt issuance is not surprising.

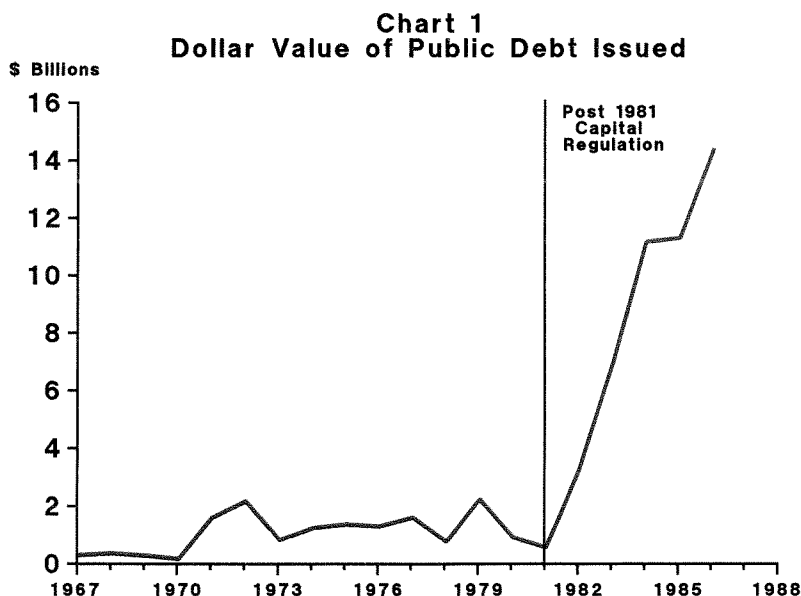
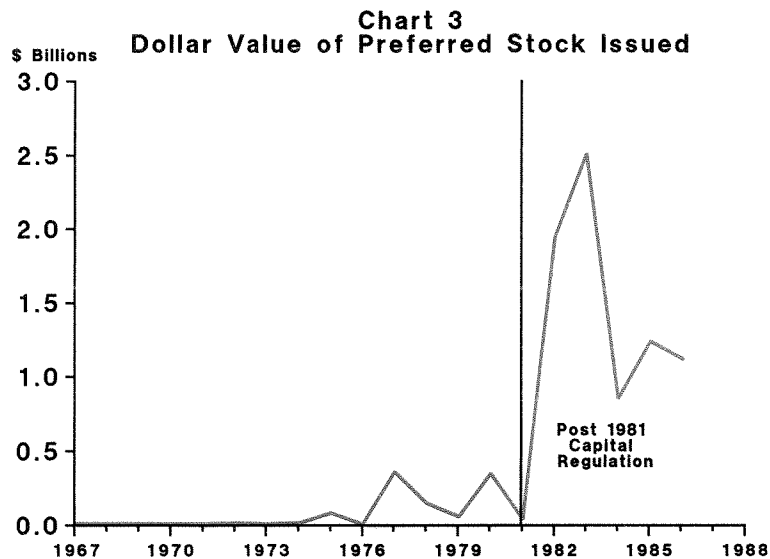
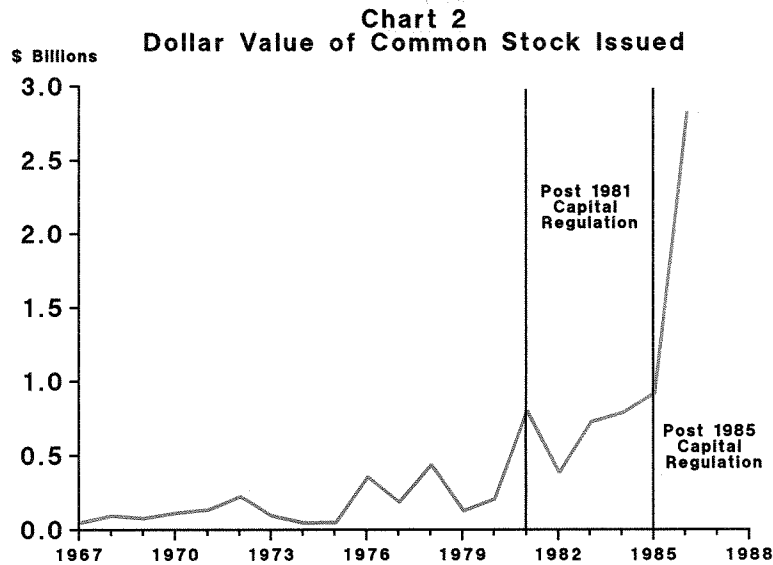


Chart 2 shows a rise in the dollar volume of common stock issued in 1981 and also an even larger rise in 1986. Some of the increased issuance in 1981 could be in anticipation of the new capital guidelines. However, it is unclear whether the even larger increase in 1986 can be explained by capital regulation unless it was in anticipation of the

risk-based guidelines which were very much in public view at the time.

Finally, Chart 3 shows a large rise in preferred stock issuance in 1982, apparently in response to the new capital guidelines.



Sample Characteristics

Table 1 displays the distribution of the sample of securities announcement events analyzed in this study by type and by year. All of these securities met the regulatory definition of either primary or total capital used between 1981 and 1986. Consistent with the evidence in Charts 1 through 3, there are more security offerings per year during the 1982–1986 period than during the 1975–1981 period. Also, debt issues were the most common, followed by preferred stock, with common stock the least frequent type of offering.

Table 2 shows the distribution of the sample of securities offerings by BHC and type of issue. It shows that 34 bank holding companies were responsible for the 155 security offerings studied here. It also shows that most of the holding companies issued several different types of securities over the 1975 to 1986 period.

Prediction Errors 1975–1986

Abnormal returns—that is, two-day (cumulative) prediction errors—averaged over the entire 1975–1986 period separately for each of seven classes of securities and associated Z statistics are presented in Table 3. In addition, average abnormal returns and Z statistics are presented for simultaneous issues of debt and common stock and debt and preferred stock.

This disaggregation of security type is based on the regulatory definition of primary and total capital that was used throughout the 1982–1986 period. All of the debt issues analyzed meet the maturity requirement for inclusion in the definition of total capital. All holding company debt legally is subordinated to deposits. Nonetheless, I also examined separately debt that was explicitly called subordinated from that not explicitly called subordinated. No significant differences were found, however.¹²

The results in Table 3 indicate that, on average, there are negative abnormal returns associated with the issuance of common stock and mandatory convertible debt (which eventually will be converted into common stock). The estimated magnitude of the announcement effect for common stock is -1.5 percent, a similar magnitude to that found in the Wansley and Dhillon (1987) and Polonchek et al. (1987) studies, both of which cover similar time periods. Simultaneous issues of common stock and debt also have significant negative announcement effects, as might be expected due to the negative effect of the common stock issuance.¹³

Significant positive abnormal returns of 1.1 percent are found for perpetual preferred stock, a result similar to that of Wansley and Dhillon (1987), who find an abnormal return of 0.8 percent, and Polonchek et al., who find an abnormal return of 1.57 percent for non-multinational BHCs during the 1982–1984 period.

These results are somewhat surprising, since, in terms of

Table 1
Distribution of Number of Issues by Type of Security

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	All Years
Common		2		3		3	1	2	4	4	3	2	24
Preferred			1	1		3	1	8	12	3	3	1	33
Convertible Debt	1				2		1				1	1	6
Mandatory Convertible Debt								3		12	6	1	22
Straight Debt	2		4	3	1	3	2	7	7	16	11	7	63
Multiple Issue			4					2		1			7
Total	3	2	9	7	3	9	5	22	23	36	24	12	155

risk characteristics, perpetual preferred is most like common stock. However, there are two important differences. First, the market may have viewed preferred stock as implicitly insured in light of the FDIC's resolution of the Continental Illinois failure in 1984. (The FDIC implicitly insured preferred stock holders as well as debt holders since the BHC was never declared insolvent.) Thus, preferred stock would have risk characteristics more similar to bank deposits than to common stock. Second, an issuance of preferred stock may contain information about the

ability of the organization to meet preferred stock dividends, which the market would view favorably.

I also find significant (at the 10 percent level) negative prediction errors (-0.74 percent) for mandatory convertible debt. None of the other studies find such an effect, but, except for Wall and Peterson (1988), neither do they distinguish between mandatory convertible debt and convertible debt. Since convertible debt is usually convertible at the issuer's option, it is much more like straight debt, whereas mandatory convertible debt has risk characteris-

Table 2
Distribution of Sample by BHC and Security Type

	BHC	Common Stock	Convertible Debt	Mandatory Convertible Debt	Multiple Issue	Preferred Stock	Straight Debt	Total
1	Bank of America	1		1		2	3	7
2	Barnett Banks	1		1		1	1	4
3	Bank of NY					1		1
4	Bank of Boston		1	1			4	6
5	Bankers Trust	2		2	1		2	7
6	Citicorp	1				6	8	15
7	Citizens First	2						2
8	Chemical NY Corp	2	1	1	1	1	2	8
9	Chase Manhattan		1	1		2	4	8
10	Equimark					1		1
11	First Bank System			1				1
12	First City Bancorp	1		1		2	1	5
13	First Fed. Bancorp	1						1
14	First Chicago	1		1		2	3	7
15	First Penn. Corp	1				1		2
16	First Wisconsin					1		1
17	First Interstate	1		1			4	6
18	J.P. Morgan	1				1	4	6
19	Key Corp	1				1		2
20	MCorp	1						1
21	Mellon						1	1
22	Manuf. Hanover		1	3	1	2	3	10
23	Marine Midland			2		1	1	4
24	NBD Bancorp		1				1	2
25	Norwest Corp					2	1	3
26	Norstar Bancorp	1				1		2
27	Banc One	1						1
28	Republic NY Corp	3			2	3	4	12
29	Signet						1	1
30	Security Pacific		1	2		1	4	8
31	Texas Commerce	1					1	2
32	United Jersey					1		1
33	Irving Bancorp			1	1			2
34	Wells Fargo	1		3	1		10	15
		24	6	22	7	33	63	155

tics similar to those of common stock and should have similar announcement effects. However, aside from their selection of a different sample of events, it is unclear why Wall and Peterson's results differ.

As in all of the studies reviewed, I do not find significant abnormal returns associated with straight debt. This finding is similar to that for industrial and utility firms and thus may reflect the low-risk nature of this security. Moreover, the market may have regarded straight debt issued by BHCs during this period as having a high probability of being FDIC-insured following the Continental episode.

I also examined cumulative prediction errors for the 18-day period between the estimation period and the (2-day) announcement period and for the 18-day period after the announcement period averaged over each type of security, but none of the average cumulative prediction errors were statistically significantly different from zero. This suggests

that the stock price announcement effects are permanent. Moreover, the market model was estimated over two other sample periods, one beginning 20 days after the announcement period (days 100–158) and another including both the pre- and post-announcement period samples (days 1–60 plus days 100–158) to test the robustness of the results. The results were remarkably similar for all three estimation periods.

In sum, these results strongly suggest negative announcement effects for issues of common stock and securities with risk characteristics similar to common stock, such as mandatory convertible debt.¹⁴ In the next sections, I test for possible differences in effects over time and between groups to determine whether deposit insurance effects are important and through what avenues capital regulation may affect the size of the announcement effects.

Table 3
Average Two-Day Prediction Errors (APE)
1975–1986, By Type of Security^a

Type of Event (Public Offerings for Cash)	APE	Z	Number of Events (155 Total)	Percent Negative
Common Stock	-.015***	-4.10	24	75%
Convertible Debt	-.0021	-.10	6	43%
Mandatory Conv. Debt	-.0074*	-1.67	22	73%
Multiple Simultaneous Issue				
Debt/Common Stock	-.031***	-2.70	2	100%
Debt/Preferred Stock	-.0072	-1.06	5	80%
Preferred Stock				
Limited Life	-.00081	-.91	9	44%
Perpetual	.011**	2.29	21	43%
Convertible	-.020	-1.31	3	67%
Straight Debt ^b	.00012	-.02	63	50%

*** Significantly different from zero at the 1% level

** Significantly different from zero at the 5% level

* Significantly different from zero at the 10% level

^a Average two-day prediction errors for the day preceding and the day of the announcement. Prediction errors are actual residual returns, not percentage returns.

^b Includes both shelf and non-shelf registration and subordinated and unsubordinated debt. However, none of the APEs is statistically significant nor are there any significant differences among these categories.

Differences over Time

Table 4 presents two-day average prediction errors for the period prior to the new capital regulations, January 1, 1975 through November 30, 1981, and for the period after the institution of the regulations, December 1, 1981 through December 31, 1986. There is a striking decline in the absolute size of the announcement effect associated with common stock issuance from -2.6 percent to -0.79 percent, which is statistically significant at the one percent level. No other significant differences are found. Thus, it appears that the institution of capital regulation did have a major effect on the stock price effect associated with common stock issuance.

Polonchek et al. also find an absolute decline in the (negative) effect of common stock issuance, although it is half as large and not statistically significant. These differences in results may be due to the more powerful statistical techniques and/or the longer sample period used in this paper. My results for the 1982–1986 period, however, differ in magnitude from those of Wall and Peterson, who find negative statistically-significant effects for common

stock issuance of -1.5 percent for this period, possibly because of the somewhat different sample they employ.

The standard explanation for the apparent decline is that increased capital regulation made equity offerings more predictable and thus diminished their information content, especially compared to the information conveyed by offerings made during the pre-December 1981 period, when they were more likely to be voluntary. To test this explanation, I examine differences in announcement effects between the group of BHCs voluntarily issuing capital and those under regulatory pressure to do so. If the information content argument were correct, BHCs under regulatory pressure to boost capital would experience less negative announcement effects associated with stock issuance after the new regulations took effect than would the other group of BHCs.

Differences Between Groups Over Time

Although objective minimum capital regulations were phased in over the 1981 to 1985 period, I would argue that the 1985 standards were the ultimate goal even as early as

Table 4
Average Two-Day Prediction Errors (APE), Before and After
the December 1981 Change in Bank Capital Regulation

Type of Event	Jan. 1, 1975– Nov. 30, 1981		Dec. 1, 1981– Dec. 31, 1986		Absolute Difference	
	APE	Z	APE	Z	APE	Z
Common Stock	-.026***	-4.60	-.0079	-1.63	.018***	2.97
Convertible Debt	-.0047	-.53	.0032	.22	.0079	.75
Mandatory Conv. Debt	—	—	-.0074*	-1.67	—	—
Multiple Issues						
Debt/Common Stock	-.031***	-2.70	—	—	—	—
Debt/Preferred Stock	-.015	-1.02	-.0023	-.18	.0043	.84
Preferred Stock						
Limited Life	-.000059	-.0033	-.0014	-.20	.0013	.20
Perpetual	—	—	.011**	2.29	—	—
Convertible	.0015	-.25	-.064	-1.89	.065	1.64
Straight Debt	-.0062	-.71	.0016	.58	.0076	1.29

*** Significantly different from zero at the 1% level

** Significantly different from zero at the 5% level

* Significantly different from zero at the 10% level

1981. The main reason the 1985 standards were not immediately imposed was to give institutions time to raise the necessary capital to bring them into compliance. In keeping with this interpretation, this paper distinguishes those banking organizations that would have met the 1985 primary capital requirements in 1981 from those that would not have. (See Keeley [1988].) Throughout the paper I refer to the former as "capital sufficient" and the latter as "capital deficient" banking organizations. As shown in Keeley (1988), capital deficient banking organizations did in fact increase capital both absolutely and relative to capital sufficient organizations.¹⁵

Table 5 presents separate estimates of the effects of common stock issuance for capital deficient and sufficient organizations both before and after the 1981 change in capital regulation. I also examined the announcement effects for each of the other types of securities issuance analyzed in Table 4, but no significant differences between the time periods or between capital sufficient and deficient groups were found.

The results in Table 5 suggest that the stock price effects for capital sufficient BHCs changed from -1.2 percent in the pre-1981 period to positive 1.5 percent in the post-1981 period. This change is statistically significant. Moreover, although capital deficient BHCs' estimated effect declined in absolute value, the change was not statistically significant.

If increased capital regulation reduced the signal content of common stock issuance, one would expect the

announcement effects to be less negative during the post-1981 period. While Table 5 does show such a pattern for each group separately, the change is not statistically significant for the capital deficient organizations. Moreover, simple signalling theory also would predict that capital deficient BHCs' returns should be less negative than capital sufficient BHCs' returns, which would be less predictable and thus should contain more information. These results thus cast doubt on this simple signalling hypothesis since the pattern of results is opposite to that which it would predict.

An alternative interpretation of these results is that securities issuance diminishes the value of the deposit insurance guarantee. The larger negative stock price effects for capital deficient banking organizations, especially during the post-1981 period, are consistent with the view that the value of (underpriced) deposit insurance is capitalized in the share prices of capital deficient banking organizations and that increases in their capital diminished the value of that asset.

A second, but not mutually exclusive hypothesis is that regulators have inside information which is revealed to investors by the nature of a security issuance.¹⁶ Below, I explore these two hypotheses further.

Capital Structure Effects

If the results in Table 5 primarily reflect a diminution of the value of deposit insurance, in theory, issues that have greater proportional effects on the capital-to-asset

Table 5
Average Two-Day Prediction Errors
Associated with Announcement of Common Stock Issuance by
Capital Deficient and Sufficient BHCs

Time Period of Event	Capital Deficient		Capital Sufficient		Absolute Difference	
	APE	Z	APE	Z	APE	Z
Pre-1981 Capital Reg. Change	-.033***	-4.43	-.012*	-1.70	.021***	2.73
Post-1981 Capital Reg. Change	-.020***	-2.90	.015	1.27	.035***	4.17
Difference	.013	1.53	.027***	2.97	.014	1.44

*** Significantly different from zero at the 1% level
 ** Significantly different from zero at the 5% level
 * Significantly different from zero at the 10% level

ratio should have more negative abnormal returns. Consequently, I regress abnormal returns on the size of the issue, measured by the percentage change in the capital-to-asset ratio caused by the common stock issue.¹⁷

The results of such regressions, estimated using generalized least squares with individual error variances calculated using Equation 5, are reported in Table 6. Separate estimates are presented for capital deficient and sufficient banking organizations for three time periods: the entire sample period, 1975–1986; the period prior to the new capital regulations, December 1, 1975 through November 30, 1981; and the period after the new regulations were introduced, December 1, 1981 through December 31, 1988.

Although the results of these regressions should be viewed with caution because of the very small sample sizes, they nevertheless do suggest a marked change in the relationship between capital deficient organizations' abnormal returns and the percentage effect of the common stock issuance on the market value capital-to-asset ratio.¹⁸ During the early period before explicit capital guidelines were in place, issues that had larger effects on the capital-to-asset ratio had less negative abnormal returns. This suggests that issues during this period were voluntary, even by banking organizations with low capital-to-asset ratios. However, during the post-December 1981 period, the point estimate suggests a negative relationship, although it is not statistically significant. In theory, if the negative mean abnormal returns were due to a diminution of the value of the deposit insurance guarantee, the relationship between the size of the issue and abnormal returns should be negative. Thus, these results are not inconsistent with this hypothesis. However, given the small sample sizes and the lack of statistical significance, neither do these results provide strong support for this hypothesis.

The results for the capital sufficient banking organizations are more striking. They show, during the post-December 1981 period, a statistically significant positive relationship between abnormal returns and the size of the issue. Thus, large issues (relative to capital) by organizations already meeting the capital requirements appear to be taken by the market as positive signals. Since such issues are voluntary,¹⁹ presumably they would not reflect a diminution in the value of the deposit insurance guarantee or an implicit regulatory tax.

In sum, the results of these regressions provide some support for the capital structure theory, which predicts that issue size relative to capital is important and that stock price effects should become more negative for capital deficient organizations as the size of the issue increases. They also suggest that the deadweight costs of common

Table 6
Relationship Between Abnormal Returns, Capital Adequacy and the Percent Change in the Capital-to-Asset Ratio Due to Common Stock Issuance^a

	1975–1986	1975–1981	1981–1986
<u>Capital Deficient</u>			
n	16	6	10
R ²	-.067	.58	.018
Intercept	-.025** (.010)	-.069*** (0.15)	-.0079 (.0098)
Percent Change in Capital to Asset Ratio	.029 (.12)	.48** (.17)	-.12 (.11)
<u>Capital Sufficient</u>			
n	8	3	5
R ²	.37	.44	.87
Intercept	-.051* (.022)	-.057 (.028)	-.063** (.014)
Percent Change in Capital to Asset Ratio	.42* (.19)	.34 (.21)	.66** (.13)

^a GLS estimates

*** Significantly different from zero at the 1% level

** Significantly different from zero at the 5% level

* Significantly different from zero at the 10% level

stock issuance for well-capitalized banking organizations are small or nonexistent since, on average, stock price announcement effects are not negative and even become more positive as the relative size of the issue increases.

Inside Information

These results also are consistent with the second hypothesis that the type of securities issued conveys inside information about earning prospects obtained by regulators during bank and bank holding company examinations. Since a banking organization's balance sheet is available to outside investors, the market can readily determine

whether the BHC is under regulatory pressure to increase its capital ratio. However, the market does not necessarily know the future prospects of the BHC or the method the BHC will use to augment capital.

It seems likely that investors would look for information about a BHC's prospects in the type of securities it issues. Capital deficient BHCs that issue common stock may be viewed by investors as needing to do so because they are under regulatory pressure not to issue securities that require increased payouts from earnings, such as debt or preferred stock. Thus, a common stock issuance by a capital deficient BHC may be a signal of management and regulator skepticism about the BHC's ability to generate sufficient future earnings to meet the cash flow requirements of additional debt or preferred stock or to generate cash flow sufficient to permit the accumulation of retained earnings to meet the new capital requirements. On the other hand, if regulators and bank management believe that the banking organization's future earnings prospects are very good, retained earnings rather than a security issuance can be used to meet higher future capital require-

ments. Moreover, a voluntary issue of common stock by a capital sufficient BHC would not provide a negative signal and might even signal the availability of a positive net present value project.

The positive effects of issue size on the abnormal returns associated with securities issuance by capital sufficient BHCs also might be explained by this hypothesis. Prior to the institution of specific minimum capital guidelines, market participants would have been unsure whether a banking organization's common stock issuance was due to regulatory pressure. Since there was some chance that it was, there was a small mean negative announcement effect even for capital sufficient organizations. However, after specific capital guidelines were introduced, market participants could be confident that a common stock issue by a capital sufficient BHC was not a signal that regulators viewed the organization's earning prospects unfavorably. As a result, in the post-1981 regulatory period, the estimated mean abnormal returns associated with capital sufficient BHCs' common stock issuance were positive and were positively related to the size of the issue.

V. Conclusions

The results of this paper yield some important conclusions regarding the stock price effects of BHCs' securities issuance, especially securities issued by weakly-capitalized banks under regulatory pressure to boost capital. These findings are particularly important in light of the new risk-based capital requirements, which will require many banking organizations to increase their capital-to-asset ratios.

First, common stock issuance appears to have negative and statistically significant announcement effects for weakly-capitalized banking organizations under regulatory pressure to raise capital. Moreover, the effects are fairly large, implying a mean abnormal return of -2 percent (which represents a dilution effect of about -30 percent) for capital deficient banking organizations during the post-1981 period. Thus, contrary to the implication of some previous studies, one cannot be sanguine that the more objective capital regulation in place since December 1981 has significantly reduced the announcement effects associated with common stock issuance for those BHCs under regulatory pressure to augment capital. However, no evidence of negative announcement effects is found for BHCs that are meeting or exceeding regulatory capital guidelines.

Second, common equity (and debt that will be converted into common equity) might appear to be the most costly form of capital from the banking organization's

standpoint since it has the largest negative announcement effects. Straight subordinated debt and limited life preferred have no significant stock price effects, and perpetual preferred actually appears to have positive effects. However, it is difficult to draw any strong policy conclusions from these results. One reason is that market participants may have viewed subordinated debt and preferred stock as being at least partially implicitly insured throughout this period.²⁰ Another reason is that the estimated announcement effects presumably result from optimizing decisions at the banking organization level. Thus, if alternatives to common stock issuance were used instead, it is unclear whether they would have lower costs. Finally, these results may reflect a decrease in the risk exposure of the deposit insurance fund (and a corresponding reduction of the capitalized value of the deposit insurance guarantee), which was the objective of the capital regulations in the first place.

Third, the data do not permit us to determine whether the negative announcement effects associated with common stock issuance simply reflect a negative signal about institutions' values or whether they are the result of a diminution of the capitalized value of the deposit insurance guarantee. While the estimated announcement effects of common stock issuance for capital deficient banking organizations appear to be negatively related to the relative size of the issue, as the deposit insurance hypothesis

predicts, the relationship is not statistically significant. Nonetheless, regulators may wish to pursue a policy of requiring more capital since neither explanation for the negative abnormal returns implies that there are social costs associated with more stringent capital regulation and more stringent capital regulation does reduce the risk exposure of the deposit insurance system.

Finally, these results suggest that banking organizations with weak capital positions will attempt to resist regulatory pressure to issue common stock in order to meet capital

requirements because of the negative effects on the value of their stock. However, since there is no evidence of negative effects for strongly-capitalized BHCs, they may not be reluctant to issue stock to finance new, positive net present value projects.²¹ Moreover, the absence of negative stock price announcement effects for strongly-capitalized banking organizations suggests that the deadweight costs associated with common stock issuance are small or non-existent for such firms.

ENDNOTES

1. Deposit insurance can be viewed as a put option on the bank's assets at a striking price equal to the promised maturity value of the insured deposits (see Merton [1977]). The value of the put increases as capital relative to assets decreases or as asset risk increases since both factors increase default risk.

2. Keeley (1988) finds that even though bank holding companies partially circumvented the more stringent capital regulations promulgated in the early 1980s, they did nevertheless boost capital-to-asset ratios in response to the regulations. Thus, it appears that BHCs do respond to more stringent capital regulations.

3. In December 1981, minimum primary capital was set at six percent of assets for banks and bank holding companies with assets less than \$1 billion and five percent for organizations with assets of \$1 billion or more except for "multinational" bank holding companies which were exempted. In June 1983, the five percent requirement was extended to the multinationals. Finally, in June 1985, a uniform 5.5 percent minimum primary capital-to-asset ratio was set for all banking organizations regardless of size.

4. Many financial executives argue that issuing shares at a price below book value depresses the stock's price because it represents a "dilution" of share value. While such a stock issuance does decrease book value per share, it should not depress the market value of the stock as long as the proceeds from the stock issuance can be invested in assets that are at least as profitable as the firm's current assets.

5. In contrast, Scholes (1972), following a different line of reasoning, argues that the demand for a stock is downward sloping due to heterogeneous expectations. Although it is difficult to reconcile heterogeneous expectations with market equilibrium (since people who think the stock is undervalued should buy, thereby driving up the stock's price, and vice versa) differential taxation might explain heterogeneous demand for a stock. Downward sloping demand, in turn, would cause price pressure when there is a new issue. This would explain why only risky securities have negative stock price effects associated with their issuance (since there would not be heterogeneous expectations for riskless securities).

6. As Furlong and Keeley (1987a, 1987b) show, the diminution in the value of the deposit insurance option associated with a given capital infusion is greatest for banking organizations with the lowest capital ratios.

7. It is unclear why they included the year 1981 since the first capital requirements did not go into effect until December 1981.

8. There are two important limitations of the Wansley and Dhillon study. First, they do not allow for potential changes in abnormal returns due to the changed capital regulatory regime beginning in 1981. Second, their announcement period is the day of and the day *after* the announcement, unlike the standard practice of using the day before and the day of the announcement. Thus, they may have underestimated the announcement effects. (I find that the largest negative residual is on the day before the announcement.)

9. Abnormal returns are calculated using the mean returns method, a procedure Brown and Warner (1985) show is not very powerful if the events are clustered in calendar time.

10. They also find significant negative abnormal returns associated with the announcement of dividend reductions both before and after December 1981, which is consistent with the negative abnormal returns associated with common stock issuance.

11. Moreover, several of these papers use statistical techniques with low power. Dhillon and Wansley use an unconventional event period, Isberg and Brown use a one-day instead of two-day event period, and Polonchek, Slovin, and Sushka use the mean adjusted return model instead of the preferable market model and use an unconventional three-day event period. Several of the studies do not adequately disaggregate different types of debt and preferred stock securities (that is, convertible versus mandatory convertible debt, limited life versus perpetual preferred stock).

12. I also tested for the possibility that shelf-registered debt would have different abnormal returns and found no significant differences.

13. Although the point estimate of the effect of the announcement of a simultaneous common/debt issue is

larger than that for common alone, the difference is not statistically significant.

14. I also found a positive announcement effect associated with perpetual preferred stock.

15. Moreover, the probability of security issuance increased for capital deficient organizations relative to capital sufficient organizations with statistically significant increases for preferred stock and debt issuance. See Keeley (1988b).

16. Another possible explanation for this pattern of returns is that the size of the offerings relative to the initial value of the firms in the two groups differs systematically. I tested for this by examining the relative dilution effects of the two groups' common stock offerings. Dilution is defined as the ratio of the change in the aggregate equity value of the outstanding shares (percent change in share price, times share price, times number of shares, divided by 100) to the total dollar proceeds of the issue. A dilution ratio of zero percent means that the announcement of a new offering does not affect the share price of existing shares, and a dilution ratio of -100 percent means that the decline in existing share value equals the value of the new capital raised by the issue. Dilution is interesting to examine because it could be that firms with the smallest abnormal returns also had very small dollar value issues and thus large dilutions.

For all BHCs I found a mean dilution effect of -27 percent, about the same as the -31 percent dilution effect found by Asquith and Mullins (1986) for industrial firms. Thus, even though the percentage stock price effect for bank holding companies is much smaller than that found for industrial firms, the dilution effect is about the same, presumably because banking organizations' stock issues typically raise far less funds in proportion to their pre-issue value than do industrial firms.

More importantly, the pattern of dilution effects is basically the same as the stock-price announcement effects. Capital deficient BHCs have more negative dilution effects

than capital sufficient BHCs and both groups show less negative effects during the post-1981 period. Thus, systematic differences in issue size do not appear to explain the pattern of abnormal returns across capital deficient and sufficient organizations.

17. This variable is equal to the value of the issue divided by the pre-issue market value of the firm's equity minus the value of the issue divided by the pre-issue market value of the firm's assets.

18. Two periods were pooled and a model was estimated which allowed the intercept and the coefficient to differ in the two periods. For capital deficient organizations, the change in both the intercept and the coefficient was statistically significant at the 5 percent level. For capital sufficient banking organizations, neither parameter was significantly different.

19. Keeley (1988c) argues that insured banks voluntarily would issue capital in order to protect their valuable charters, which would be forfeited in the event of bankruptcy.

20. As long as subordinated debt and preferred stock are not implicitly insured, there is no apparent theoretical reason to restrict their use as a type of banking capital. They provide the same protection to the deposit insurance fund as common equity and they may have lower costs. See Furlong and Keeley (1987c).

21. These results are consistent with several empirical studies (Marcus and Shaked [1984], Ronn and Verma [1986], and Pennacchi [1987]) which find that for many large banking organizations, the fair value of deposit insurance appears to be less than its price. However, since the value of deposit insurance need not be capitalized into the value of the banking organization and instead may benefit bank depositors and/or borrowers, one cannot conclude from these results that more capital would not significantly reduce the risk exposure of the deposit insurance system.

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