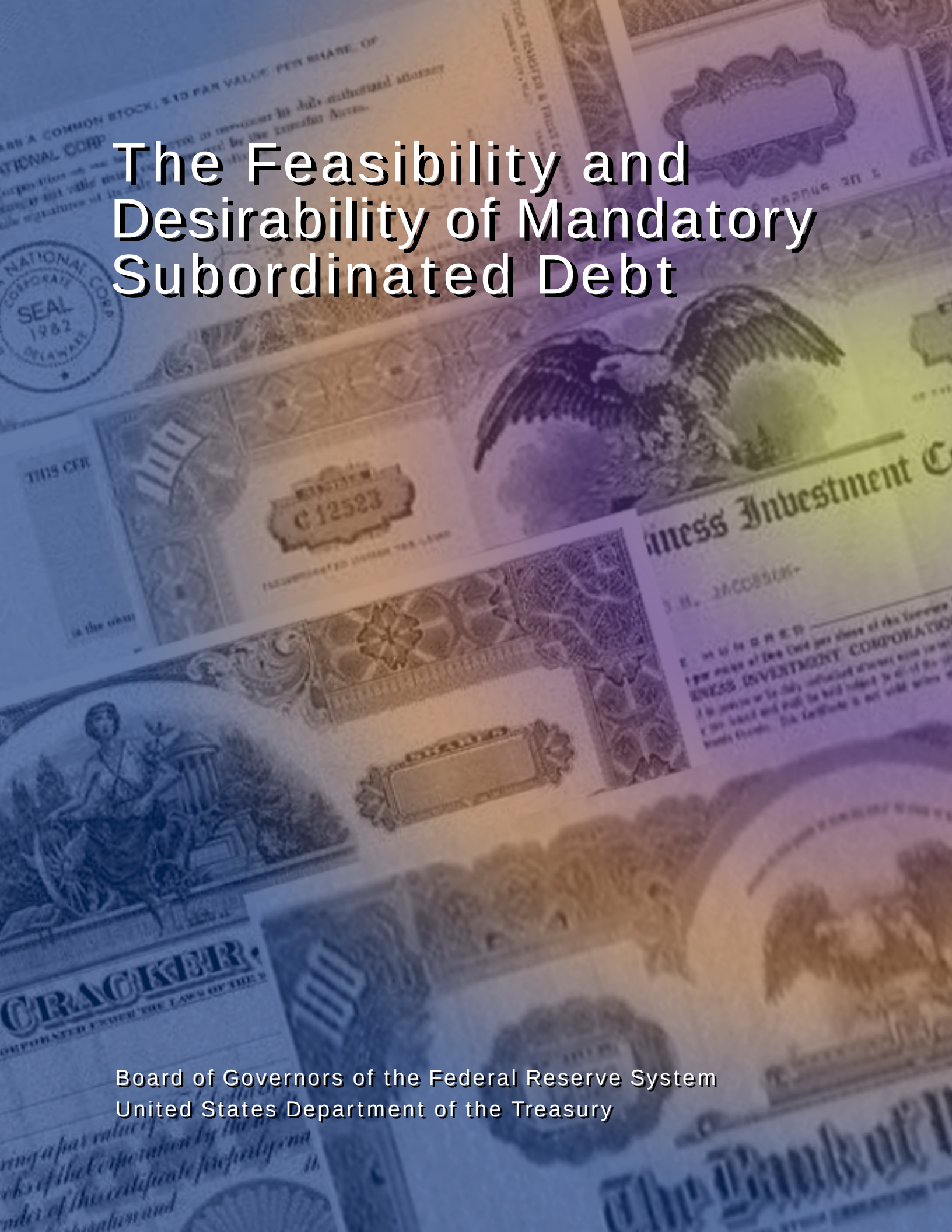

The Feasibility and Desirability of Mandatory Subordinated Debt

Board of Governors of the Federal Reserve System
United States Department of the Treasury

The Feasibility and Desirability of Mandatory Subordinated Debt

Report by the Board of Governors of the Federal Reserve System and the Secretary of the U.S. Department of the Treasury, submitted to the Congress pursuant to section 108 of the Gramm-Leach-Bliley Act of 1999

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PREFACE

This report considers the feasibility and desirability of a mandatory subordinated debt policy for systemically important depository institutions and/or depository institution holding companies in accordance with provisions of section 108, Public Law 106-102, the Gramm-Leach-Bliley Act of November 12, 1999. It was drafted jointly by the staff at the Board of Governors of the Federal Reserve System and the United States Treasury. Contributing to this report were Myron L. Kwast, Associate Director, Diana Hancock, Chief, Monetary and Financial Studies, and Daniel M. Covitz, Economist, from the Division of Research and Statistics, and John F. Connolly, Supervisory Financial Analyst, from the Division of Bank Supervision and Regulation, Board of Governors of the Federal Reserve System; and Joan Affleck-Smith, Director for the Office of Financial Institutions Policy, Matthew P. Green, Financial Analyst, and Jason H. Pates, Financial Economist, from the Office of Financial Institutions Policy, U.S. Treasury. Also participating in the Study Group were William W. Lang, Deputy Director, Special Studies, and Douglas Robertson, Financial Economist, Policy Analysis Division, Office of the Comptroller of the Currency.

RECOMMENDATIONS

In accordance with the provisions of the Gramm-Leach-Bliley Act of 1999, the Board of Governors of the Federal Reserve System (Board) and the Secretary of the Treasury (Secretary) make the following findings and conclusions regarding using subordinated debt to increase market discipline at depository institutions and to protect the deposit insurance funds. These findings and conclusions are based on the analysis and evidence presented in this Report.

(1) The Board and the Secretary believe that existing evidence supports efforts to use subordinated debt as a way to encourage market discipline. Therefore, the Board, the Office of the Comptroller of the Currency (OCC), and the Office of Thrift Supervision (OTS) will continue, and explore opportunities to enhance, their use of data from the subordinated debt, equity and other markets to evaluate the current and expected future condition of large depository organizations. With respect to subordinated debt, the Board, the OCC, and the OTS will continue, as part of the supervisory process, to monitor both yields and issuance patterns of individual institutions. Currently, virtually all of the largest banking organizations issue subordinated debt and have subordinated debt outstanding in excess of one percent of their assets. In addition, the agencies will continue research and development programs aimed at improving existing methodologies for using such data in supervisory monitoring.

(2) A policy of mandatory subordinated debt issuance may potentially enhance market discipline and safety and soundness. Nonetheless, the Board and the Secretary believe that additional evidence must be gathered before they can support a request for legislative authority to impose a requirement that large insured depository institutions or their holding companies maintain some portion of their capital in the form of subordinated debt.

(3) Accordingly, the Board and the Secretary will consider the evidence obtained about subordinated debt from market practices, research, and, most importantly, supervisory experience with subordinated debt going forward. If additional evidence suggests that legislation requiring issuance of subordinated debt by certain institutions is appropriate, the Secretary or the Board may recommend such a policy to Congress.

SUMMARY OF FINDINGS

Since the mid-1980s, a growing number of observers have proposed using subordinated debt to increase the degree of market discipline applied to federally insured depository institutions and their holding companies. While policy proposals vary, all would mandate that organizations subject to the policy issue and maintain a minimum amount of subordinated debt. In recent years, the perceived need for more market discipline has derived primarily from the increasing size and complexity of the largest banking and other depository organizations, which have made the supervisors= job of protecting the safety and soundness of the banking system more difficult.

In response to such concerns, the Gramm-Leach-Bliley Act of 1999 directed the Board of Governors of the Federal Reserve System (Board) and the Secretary of the Treasury (Secretary) to study and report to Congress whether it would be feasible and appropriate to require systemically important depository institutions and their holding companies to maintain some portion of their capital in the form of subordinated debt. This Report responds to that directive.

Objectives of a Subordinated Debt Policy

A subordinated debt policy could be designed to achieve varying degrees of five objectives. The policy could improve *direct market discipline* if an institution=s expected cost of issuing subordinated debt became more directly related to purchasers= perceptions of the riskiness of that institution. The anticipation of higher funding costs from increased risk would provide an incentive for the issuing organization to refrain from taking excessive risk.

The objective of augmenting *indirect market discipline* would be achieved if a subordinated debt policy made secondary market prices for an institution=s subordinated debt more directly related to the institution=s risk. Improved indirect market discipline would be exerted if a rise in secondary market subordinated debt yields were interpreted by investors and others as a signal of increased risk, leading them to demand higher returns on other liabilities or to otherwise limit their exposure to the bank or other type of depository institution. Depository institution supervisors could also exert indirect discipline if they took the increase in secondary market yields as a signal of potentially increased institution risk and took actions to address that possibility.

A third objective of a subordinated debt policy would be to stimulate *improved transparency and disclosure* at depository institutions, thereby encouraging both direct and indirect market discipline. In order to price risk accurately, purchasers of subordinated debt need a clear picture of a depository institution=s overall riskiness. If such a picture is not forthcoming from the issuing institution, purchasers may require higher yields than would otherwise be the case or perhaps not even be willing to buy an institution=s subordinated debt at any price.

Issuance of subordinated debt might also achieve the objective of *increasing the size of the financial cushion provided to the federal deposit insurer*. When an institution fails, subordinated debt holders receive their funds only after the deposit insurer has been fully compensated. Thus, increased issuance of subordinated debt could increase the deposit insurer=s financial cushion.

A fifth objective sometimes specified for issuance of subordinated debt is to *reduce the tendency for depository institution supervisors to forbear their resolution of a troubled institution*. Because subordinated debt holders receive their funds after the deposit insurer in a depository institution failure, they may have an incentive to encourage supervisors to take prompt corrective actions against a troubled depository institution.

Current Benefits of Voluntary Subordinated Debt Issuance

Existing evidence supports efforts to use subordinated debt as a way to encourage market discipline. The vast majority of the largest U.S. banking organizations already issue subordinated debt. There is evidence described in the Report that this issuance provides some direct market discipline and transparency. Current voluntary issuance also has provided indirect market discipline insofar as private market participants and the supervisory agencies make use of subordinated debt prices in monitoring these organizations. Both the Board and OCC develop reports on a regular basis that rank the debt spreads of large banking organizations and track changes in spreads over time. Significant changes in debt spreads, whether in absolute terms or compared to peer banks, may prompt discussions between field staff and headquarters which might result in more intensive monitoring of the institution. Although large banking organizations could desist from issuing subordinated debt, the agencies= risk-based capital rules -- which already treat limited amounts of subordinated debt as regulatory capital -- provide a strong incentive for continued issuance.

Is a Mandatory Subordinated Debt Policy for Large Banking Organizations Feasible and Appropriate at this Time?

The evidence suggests that a mandatory subordinated debt policy could advance in varying degrees the five goals set forth above, thereby potentially improving safety and soundness. As described below, this Report concludes in favor of continuing research and supervisory analysis of voluntary subordinated debt issuance and deferring any recommendation of a mandatory subordinated debt policy. First, as noted above, the current voluntary issuance of subordinated debt by most large banking organizations already provides some of the benefits sought through a mandatory policy. Second, as described below, the research and supervisory experience with subordinated debt to date leave uncertainty about the ability to achieve some of the objectives of a policy. Third, even in the absence of subordinated debt issuance, supervisors could still obtain useful market signals from equity and possibly other market prices. Fourth, implementation of even the most straightforward mandatory policy would impose some costs on banking organizations, and more complex policies could impose substantial costs. On balance, the net benefits of a mandatory policy over voluntary issuance are currently too uncertain to justify adopting a mandatory policy.

Improving direct market discipline. The Report concludes that subordinated debt does provide direct market discipline. A policy of mandatory subordinated debt could enhance this direct market discipline because large banking organizations could be required to continue to issue subordinated debt during times of banking system or bond market stress. The Report concludes that the discipline imposed by subordinated debt is strongest at such times, when riskier banking organizations are less likely to issue such debt than are safer institutions.

Improving indirect market discipline. There is also evidence that mandatory subordinated debt could increase indirect market discipline. Existing evidence, however, does not allow for a strong judgment regarding the incremental benefits of such a policy. Secondary markets for the subordinated debt of the largest banking organizations are generally deep and liquid, in part because it is common for the largest banking organizations currently to issue subordinated debt at least twice per year. Mandatory issuance would likely encourage additional liquidity. Secondary market debt spreads consistently reflected risk differences across banking organizations throughout the 1990s, and market participants and depository institution supervisors follow such spreads.

The evidence also indicates that the interpretation of subordinated debt spreads is subject to substantial uncertainty because many factors other than risk can affect such spreads. Thus, interpreting spreads must be done with great care. Liquidity in the secondary market, for example, can rapidly and unexpectedly change. After the Russian default in August 1998 and the subsequent market turmoil, liquidity was dramatically reduced in banking organization debt markets as well as in debt markets more generally. In addition, factors such as shortages and surpluses in particular issues and an issue=s specific characteristics (e.g. size, maturity, and whether an option is attached) can affect spreads. Indeed, there is considerable room for improving existing methodologies for extracting information on firm risk from subordinated debt (and other) market prices and spreads. Ongoing market developments and research in this area are encouraging.

Encouraging transparency and disclosure. A mandatory subordinated debt policy would be likely to encourage transparency and disclosure at affected depository institutions, especially during periods of banking distress and volatile bond markets when risky institutions would otherwise tend not to issue. Market participants interviewed for this and a recent Federal Reserve study claimed that substantially more information is revealed to the market at issuance. Market participants perceived that issuance compels disclosure of information about an institution=s current condition and prospects, and that such disclosures refresh secondary market prices and enhance market discipline. The small amount of research that has examined this issue generally supports the views of market participants.

Enlarging the deposit insurance financial cushion. It is uncertain whether a mandatory subordinated debt policy would enlarge the private funding cushion protecting the deposit insurance funds. The scenarios analyzed in this Report, however, suggest that increasing the size of the financial cushion for the deposit insurer should not be viewed as a major potential benefit of a subordinated debt policy. Evaluation of any potential benefit is quite complex. First, existence of a benefit assumes that large banks would be forced to issue additional subordinated debt, though most already issue considerable amounts. In addition, the effect on the insurance fund=s cushion depends upon whether, other things equal, a depository institution would substitute additional subordinated debt for insured deposits, uninsured deposits or other uninsured liabilities. If the substitution were between subordinated debt and other (nondeposit) uninsured liabilities, and perhaps even equity, a mandatory subordinated debt policy would have

no effect on the deposit insurance cushion. The deposit insurance cushion benefits under a holding company subordinated debt policy are even more uncertain, and would depend on whether or not and in what form the proceeds were downstreamed to the bank, and what funds they would replace.

Discouraging supervisory forbearance. Whether a mandatory subordinated debt policy would further discourage regulatory forbearance is probably the most uncertain potential benefit of such a policy. Most subordinated debt proposals would continue to leave the depository closure decision in the hands of the supervisor, who already has fairly strong statutory guidance to avoid forbearance except in the most extreme circumstances.

Other considerations. Going forward, in evaluating the potential benefits of various subordinated debt policies, other factors should be considered. First, key complementary supervisory and regulatory policies have not been fully tested by events. For example, the prompt corrective action and least cost resolution provisions of the FDIC Improvement Act of 1991, both of which were intended to encourage market discipline and deter regulatory forbearance, were only implemented fully after the end of the last economic downturn. Neither policy has been tested under the stressful economic conditions for which they were primarily designed. Successful implementation during such conditions would be likely to further encourage market discipline and reduce market participants= expectation of regulatory forbearance.

Equally important, existing international capital standards (the Basel Accord) are currently under extensive review. It is expected that substantial changes will be made in the near future that should encourage market discipline, especially at the largest and most complex banking organizations. The banking agencies are also considering requiring augmented disclosures by banking organizations to encourage market discipline. Reforms in any of these areas could reduce the need for a mandatory subordinated debt policy aimed at improving market discipline.

Potential costs. The costs of a mandatory subordinated debt policy would depend on the specific features of the policy, the characteristics of each individual depository institution, and the stage of the business cycle. Market participants indicated that the reduction in funding options, including higher risk premiums during periods of market stress, would be a potentially important cost at affected institutions. The lack of funding options would be especially

important if the policy required the subordinated debt to be issued by an insured depository rather than by its holding company. Virtually all publicly traded subordinated debt is currently issued by the holding company.

Need for monitoring and research. Although the evidence does not support implementation of a mandatory subordinated debt policy at this time, the evidence does merit continued research and evaluation. In addition, future changes in other regulatory policies and other developments may help to clarify the potential for achieving substantial benefits from a mandatory subordinated debt policy. At a minimum, the evidence supporting the existing risk sensitivity of the debt issuance decision, issuance spreads, and secondary market spreads clearly justifies the continued monitoring and evaluation of such decisions and spreads by bank supervisors. Moreover, this evidence also supports continued efforts by bank supervisors, researchers and market participants to improve their ability to interpret changes in depository and depository institution holding company decisions to issue subordinated debt and movements in issuance and secondary market spreads.

I. INTRODUCTION

Over the last decade, financial markets and institutions have evolved at a rapid and unprecedented pace. Regulatory, financial, and technological innovations, together with market forces, have dramatically altered the size, scope, and complexity of financial institutions. At the same time these changes have created a complex web of counterparty exposures, imbedded options, and contingent liabilities that many perceive could increase systemic risk to the U.S. financial system.

Regulatory, financial, and technological innovations have also reduced the geographic constraints on depository institutions. The elimination of interstate banking constraints combined with the variety of ways that new financial technologies are utilized to do business over broader geographic areas have helped create a growing number of very large depository institutions and depository institution holding companies that can compete in global markets.

The erosion of legal and regulatory barriers has permitted depository institutions and their holding companies to expand the scope of their activities. For example, U.S. financial holding companies can affiliate with securities firms and insurance companies and may also engage in any other activity that the Board and the Secretary of the Treasury determine to be financial in nature or incidental to financial activities.

Technological innovations and new financial engineering techniques have not only changed financial markets, but also have provided new tools for financial institutions to take, measure, and control risks. Importantly, the faster speed and lower costs associated with transactions have improved the depth and liquidity of financial markets. These improvements, together with advances in financial theory, have led to the creation of increasingly sophisticated financial services designed to meet the needs of financial institution customers. In many cases, such services contain imbedded options or contingent liabilities that may expose the provider to losses, unless they are offset by other contracts or positions that the financial institution has undertaken. Because of such risks and their offsets, increasingly sophisticated and complex tools are being used to assess the true risk exposure undertaken by depository institutions, holding companies, and their counterparties.

Even the most sanguine observers realize that such striking changes have made the supervisor's job of protecting safety and soundness increasingly difficult. Moreover, the failure of a very large depository institution could not only pose substantial risk to economic conditions

and financial stability, but could also deplete its deposit insurance fund. Further, there is little experience in assessing the combined risks of large entities that provide both bank and traditionally non-bank activities. While innovative tools for risk management developed by practitioners and academics alike may ultimately support and strengthen the supervisory and regulatory process, these tools are based on relatively recent financial theories that have yet to be tested under the full range of market conditions. Moreover, the sophistication and complexity of these modern tools often make it more difficult for supervisors to assess the risk of federally insured depository institutions and their holding companies.

In this rapidly evolving world, some policymakers, bankers, and scholars argue that market forces could be harnessed to (1) encourage depository institutions to refrain *ex ante* from excessive risk-taking; (2) provide signals about the risk exposure (or default probability) of a depository institution or depository institution holding company that could be used by private parties, and possibly government supervisors; and (3) influence managerial actions. One approach for harnessing such market forces, which to date has received considerable attention, is to adopt a mandatory subordinated debt policy.

A. Objectives Stipulated in the Gramm-Leach-Bliley Act

In the Gramm-Leach-Bliley Act of 1999 (GLB, 1999), the Congress directed the Board of Governors of the Federal Reserve System and the Secretary of the Treasury to study whether it would be feasible and appropriate to require systemically important depository institutions and/or depository institution holding companies to maintain some portion of their capital in the form of subordinated debt.[1] Specifically, the Congress requested these federal agencies to address three separate questions:

1. The feasibility and appropriateness of establishing a requirement that, with respect to large insured depository institutions[2] and depository

[1]See section 108, Public Law 106-102, the Gramm-Leach-Bliley Act of November 12, 1999.

[2]The term "insured depository institution" has the meaning given the term in section 3(c) of the Federal Deposit Insurance Act.

institution holding companies,[3] the failure of which could have serious adverse effects on economic conditions or financial stability, such institutions and holding companies maintain some portion of their capital in the form of subordinated debt[4] in order to bring market forces and market discipline to bear on the operation of, and the assessment of the viability of, such institutions and companies and reduce the risk to economic conditions, financial stability, and any deposit insurance fund;

2. If such requirement is feasible and appropriate, the appropriate amount or percentage of capital that should be subordinated debt consistent with such purposes; and

3. The manner in which any such requirement could be incorporated into existing capital standards and other issues relating to the transition to such a requirement.

This Report responds to the Congressional requirement and proceeds as follows. First, the potential objectives of a mandatory subordinated debt requirement are presented. Then, section II considers the existing subordinated debt market and analyzes the potential benefits of a mandatory subordinated debt policy in the context of these market conditions. Although this Report does not recommend a mandatory subordinated debt policy at this time, section III considers how various features of such a policy could be combined to place greater emphasis on some policy objectives rather than others and to increase potential benefits or reduce potential costs. The final section of the Report provides a brief conclusion.

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[3]The term "bank holding company" has the meaning given the term in section 2 of the Bank Holding Company Act of 1956.

[4]The term "subordinated debt" means unsecured debt that has an original weighted average maturity of not less than five years; is subordinated as to payment of principal and interest to all other indebtedness of the bank, including deposits; is not supported by any form of credit enhancement, including a guarantee or standby letter of credit; and is not held in whole or in part by any affiliate or institution-affiliated party of the insured depository institution or bank holding company.

B. Objectives of a Mandatory Subordinated Debt Requirement

Over the last two decades, five objectives have been suggested for a mandatory subordinated debt requirement. All are intended to improve the safety and soundness of both individual financial institutions and the overall financial system, and to reduce the risk of loss to taxpayers.[5]

Improve Direct Market Discipline

Early subordinated debt proposals focused on increasing "direct" market discipline on banking organizations. Direct market discipline is exerted when a firm's expected cost of issuing debt instruments increases substantially with an increase in its risk profile. For this to occur, investors must gather information about the firm's risks and prospects, and then incorporate that information into their decisions to buy the firm's debt. The anticipation of substantially higher funding costs should provide an incentive *ex ante* for the firm to refrain from excessive risk taking. Consistent with their direct discipline focus, typical features of early proposals included a minimum percentage of deposits, or assets, to be held in the form of subordinated debt, and fairly frequent exposure to market judgment by requiring that each banking organization periodically issue new debt.

Augment Indirect Market Discipline

More recently, proposals have focused on the objective of augmenting indirect market discipline. This type of market discipline is exerted when private parties or government supervisors monitor secondary market prices of debt instruments in order to help determine the risk exposure (or default probability) of a depository institution. In response to perceived increases in bank risk, such parties could substantially increase the institution's cost of funds throughout the liability structure, limit its supply of funding, or reduce its ability to engage in certain types of contracts. Subordinated debt proposals focusing on indirect market discipline have typically tied supervisory examinations and prompt corrective action triggers (including the definition of a critically undercapitalized depository institution) to subordinated debt spreads over Treasury securities with comparable maturities or to subordinated debt spreads over

[5]Appendix A provides an updated summary of proposals that were described in Board of Governors of the Federal Reserve System, 1999, "Using Subordinated Debt as an Instrument of Market Discipline," Staff Study 172, Washington, D.C., December.

corporate bond yields of a specified bond rating category. In addition, some of these proposals would restrict the growth of an institution that could not raise subordinated debt at an issuance spread below a specified rate cap. Indirect market discipline from private parties would operate in a less formal fashion than such "hard-wired" supervisory actions, but would presumably also increase bank operating costs in response to perceived increases in bank risk.

Improve Depository Institution Transparency and Disclosure

Another objective of requiring the issuance of subordinated debt is to create a market incentive for improving depository institution transparency and disclosure. Because subordinated debt holders have their own funds at risk, it is natural that such lenders would demand sufficient information to evaluate credit risk. Unlike depositors who, even if their deposits are uninsured, typically have investments that mature within a few months or that can be withdrawn on demand, subordinated debt holders generally have to view depository institution operations from a longer-term perspective. Moreover, unlike stockholders, subordinated debt holders cannot generally receive any benefit from increased risk.[6]

Increase the Size of the Financial Cushion for the Deposit Insurer

Another frequently mentioned objective of a mandatory subordinated debt policy is to increase the size of the financial cushion for the deposit insurer. Although subordinated debt is not available to absorb losses in a solvent institution (and hence is not considered equivalent to equity from a safety and soundness perspective), it does have utility as a funding source for depository institutions and importance to an insurer or uninsured creditor if it may provide an additional cushion in the event of failure. Further, because debt is generally considered to be less expensive to issue than equity (i.e., lower underwriting fees and other expenses) and because the interest payments on debt are tax-deductible, this financial cushion would likely come at a lower cost to the issuer than would a similar-size financial cushion composed of equity.

[6]Because short-term debt holders may exit before problems materialize, they need not take a longer-term perspective.

Reduce Regulatory Forbearance

Several proposals have focused on reducing regulatory forbearance.[7] These proposals typically tied the definition of insolvency to the ability of the depository institution to issue subordinated debt. In some proposals, holders of subordinated debt would be allowed to "put" the debt back to the issuing depository institution or to the deposit insurer. Thus, failure to reissue the debt after such circumstances would be deemed an insolvency event to be soon followed by sale or liquidation, preventing forbearance. In other proposals, subordinated debt holders would be given an equity stake when a depository institution's capital level fell below a prescribed level. Then, there would be a specified period for the institution to recapitalize itself or find an acquirer before liquidation proceedings would ensue.

To summarize, five objectives for a mandatory subordinated debt requirement have been identified: (1) to improve direct market discipline; (2) to augment indirect market discipline; (3) to improve transparency and disclosure; (4) to increase the size of the financial cushion for the deposit insurer; and (5) to reduce regulatory forbearance. Of course, these objectives are neither separate nor independent from one another. However, alternative design features for a mandatory subordinated debt policy can place greater emphasis on some objectives than on others.

II. IS A MANDATORY SUBORDINATED DEBT REQUIREMENT ON LARGE BANKING ORGANIZATIONS FEASIBLE AND APPROPRIATE?

This section of the Report begins by considering the existing subordinated debt market. It then presents an assessment of existing market conditions, empirical evidence, and supervisory information to ascertain whether each of the five objectives specified above could reasonably be attained with the implementation of a mandatory subordinated debt policy in the near term. Next, the effects of, and the interaction between, various potential features of a subordinated

[7]Regulatory forbearance refers to the supposed tendency of supervisors to delay excessively in taking action against an institution in financial distress.

debt policy are analyzed in the context of operational feasibility, potential benefits, and potential costs.

A. Background on Current Market Conditions

To develop a thorough understanding of the existing subordinated debt market, the study group conducted interviews with market participants, tapped the expertise of supervisory staff, and collected data both from vendors and from broker-dealers in the subordinated debt market.[8] To ascertain whether subordinated debt markets might be effective for exerting either direct or indirect market discipline on depository institutions and/or depository institution holding companies, the study group focused on (1) the depth of the existing market for subordinated notes and debentures; (2) the liquidity and homogeneity of existing subordinated debt instruments; (3) the typical issuance frequencies by large depository institutions and/or depository institution holding companies; (4) the quality of publicly available data on secondary market prices and issuance market prices for monitoring and other indirect market discipline purposes; (5) the factors affecting issuance decisions by depository institutions and depository institution holding companies; (6) the subordinated debt issuance costs relative to equity issuance costs; and (7) the eligibility of existing outstanding subordinated debt for regulatory capital purposes.

Market Depth

The majority of corporate bonds is traded on the over-the-counter (OTC) market, which is a loose organization of traders without a centralized physical location. Rather, OTC participants communicate with each other electronically from their own offices. Although there are few reliable statistics on the actual trading volume in the OTC bond market, it is possible to observe the annual issuance of bonds, which has exceeded $1 trillion in recent years (table 1).

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[8]Some market participant interviews followed up on interviews that were initially conducted by Federal Reserve staff between early October 1998 and early March 1999. The initial interviews are summarized in Board of Governors (1999). Other market participant interviews were conducted during early 2000 by Federal Reserve, Department of Treasury, and Office of the Comptroller staff.

It is notable that bond issuance by financial institutions eclipses bond issuance by non-financial institutions. Further, the subordinated debt issued by banks and bank holding companies was only a small percentage -- between 1.2 percent and 2.3 percent -- of the corporate debt issued by all financial institutions. These data suggest that there is a fairly deep public market for the debt issued by financial institutions and that a modest increase in subordinated debt issuance by systemically important depository institutions would likely be fairly easily accommodated by the U.S. corporate bond market.

TABLE 1. SUMMARY STATISTICS ON GROSS BOND ISSUANCE †
ANNUAL DATA, MILLIONS OF DOLLARS

YEAR	U.S. CORPORATE	NON-FINANCIAL INSTITUTIONS	FINANCIAL INSTITUTIONS*	MEMO ITEM: SUBORDINATED DEBT ISSUED BY BANKS AND BANK HOLDING COMPANIES
1995	525,840	135,876	389,964	8,785
1996	651,108	167,904	483,204	11,877
1997	811,380	222,600	588,780	7,056
1998	1,001,736	307,932	693,804	9,090
1999	941,304	293,964	647,340	7,745

†Federal Reserve data on annual issuance volumes by U.S. corporations, non-financial institutions, and financial institutions include both domestic offerings and those sold abroad. Data on annual issuance volumes by banks and bank holding companies were provided by Banc America Securities using information from Securities Data Company and do not include private placements.

*Financial institution issuance includes asset-backed securities. Such securities account for approximately one-third of the total.

Liquidity

The secondary market for the subordinated debt of the 15 to 20 largest depository institutions and their holding companies, ranked by total assets, is a dealer market that is dominated by institutional investors (e.g., insurance companies and pension funds). It is highly liquid most of the time, as evidenced by tight bid-ask spreads that typically fluctuate between 1 to 5 basis points for subordinated debt issues that are in the $250 million to $500 million size

range.[9] However, after the Russian default in August 1998 and the subsequent market turbulence, liquidity was greatly reduced and the bid-ask spread for similar-size issues rose to about 10 basis points before returning to levels near the top of their previous range. For smaller-size issues, spreads ballooned to 30 basis points or more during the period after the Russian default.

A few market participants were skeptical about the liquidity of the subordinated debt issued by depository institutions during more normal market times. However, the overwhelming impression delivered by market participants was that the market for issues of $150 million or larger was usually quite liquid, to the point that the market provided a useful vehicle for trading and hedging.

Homogeneity of Existing Subordinated Debt Instruments

One reason for the secondary market's liquidity is that the characteristics of subordinated debt instruments are fairly homogeneous across both financial institutions and time, particularly for bonds issued by the largest depository institutions.[10] This is illustrated in the annual data on the characteristics of subordinated bonds with issue sizes greater than $75 million issued by the largest 20 bank holding companies and by the rest of the largest 50 banking organizations during the 1990-99 period, which are presented in tables 2 and 3, respectively. Issues of the 20 largest banking organizations (table 2) tend to be more standardized than are issues of smaller bank holding companies (table 3). By and large, issues of the former group do not have call options, have maturities between 10 and 20 years, pay coupons semi-annually, and are fixed-rate. In contrast, issues of smaller bank holding companies are more likely to have call options and to pay coupons more frequently than semi-annually. The considerable homogeneity in the characteristics of debt issued by the largest depository institutions makes it easier to compare yields, the basis for both direct and indirect market discipline.

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[9]Based on data provided by market participants.

[10]As discussed below, capital regulations have contributed to the homogeneity of subordinated debt instruments issued by banking organizations.

Another reason why the secondary market is normally liquid is that issue sizes for subordinated debt have tended to be quite large, particularly for the largest depository institutions. Comparing data on the amounts issued by the 20 largest banking organizations and by the rest of the 50 largest banking organizations in tables 2 and 3, it is apparent that larger depository institutions are more likely to issue subordinated debt with a larger issue size. Moreover, as the 1990s progressed, the average size of a subordinated debt issue for the 20 largest banking organizations more than doubled, and generally, though not always, increased from one year to the next. Interestingly, however, the average size of a debt issue for the rest of the 50 largest banking organizations has fluctuated around $200 million over the same time period, despite the fact that the largest issue in a year was sometimes made by a holding company that was not among the 20 largest banking organizations.

During the last half of the 1990s, there was a notable increase in the number of issues of less than $75 million by the 50 largest banking organizations. Table 4 presents instrument characteristics on these relatively small issues, which are less likely to be actively traded in public markets. Such characteristics appear to change over time to accommodate niche retail or wholesale markets. For example, in the early 1990s small issue size instruments were not callable, but more recently virtually all such instruments have been callable. Also, while in 1994 and 1995 these instruments typically had relatively short maturities (10 years or less), during the 1996-99 period they generally had longer maturities (10 years or more). Interestingly, these smaller-size issues typically pay coupons on a monthly basis, but some are even zero-coupon bonds. On the whole, such a lack of standardization across issues would make it difficult to compare spreads across organizations even if they were traded on a frequent basis.

TABLE 2. CHARACTERISTICS OF SUBORDINATED DEBT ISSUES WITH ISSUE SIZES GREATER THAN $75 MILLION FOR THE 20 LARGEST BANKING ORGANIZATIONS ANNUAL DATA, 1990-1999

CHARACTERISTICS	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Callable (in percent)										
No	100	95	100	100	64	59	94	82	84	100
Yes	0	5	0	0	36	41	6	18	26	0
Maturity (in percent)										
Less than 10 yrs.	25	10	17	0	4	28	3	0	4	0
10 yrs.	63	70	71	63	52	41	55	59	42	75
10-20 yrs.	13	20	12	35	40	17	32	29	4	13
More than 20 yrs.	0	0	0	2	4	14	10	12	50	13
Coupon frequency (in percent)										
Zero	0	0	0	0	0	0	0	0	17	0
Semi-annual	100	100	95	79	96	97	94	94	67	100
Quarterly	0	0	5	21	4	0	0	6	17	0
Monthly	0	0	0	0	0	3	6	0	0	0
Amount issued ($ millions)										
Minimum	100	100	100	75	100	100	75	85	100	299
Maximum	200	300	500	600	500	443	500	493	601	1000
Mean	141	151	207	203	201	194	251	263	287	507
Median	125	138	200	200	150	150	248	250	250	399
Rate type (in percent)										
Fixed	100	100	95	79	96	100	97	100	95	100
Floating	0	0	5	21	4	0	3	0	5	0
Total issues per year	8	20	41	43	25	29	31	17	25	8
Numbers of institutions	6	11	16	14	11	10	14	7	13	6

TABLE 3. CHARACTERISTICS OF SUBORDINATED DEBT ISSUES WITH ISSUE SIZES GREATER THAN $75 MILLION FOR THE SMALLEST 30 OF THE 50 LARGEST BANKING ORGANIZATIONS ANNUAL DATA, 1990-1999

CHARACTERISTICS	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Callable (in percent)										
No	100	100	100	100	100	89	100	67	33	66
Yes	0	0	0	0	0	11	0	33	67	33
Maturity (in percent)										
Less than 10 yrs.	0	0	8	17	0	11	0	0	20	0
10 yrs.	67	80	58	83	86	56	67	67	0	75
10-20 yrs.	0	7	33	0	14	11	0	0	20	20
More than 20 yrs.	33	20	0	0	0	22	33	33	60	25
Coupon frequency (in percent)										
Zero	0	0	0	0	0	0	0	0	0	0
Semi-annual	100	100	100	100	100	100	100	67	40	75
Quarterly	0	0	0	0	0	0	0	33	60	25
Monthly	0	0	0	0	0	0	0	0	0	0
Amount issued ($ millions)										
Minimum	100	100	100	100	100	100	100	200	200	100
Maximum	200	750	300	250	250	298	300	350	200	199
Mean	133	203	149	133	186	189	200	267	200	157
Median	100	125	138	100	200	150	200	250	200	174
Rate type (in percent)										
Fixed	100	100	100	100	100	100	100	67	100	100
Floating	0	0	0	0	0	0	0	33	0	0
Total issues per year	3	10	12	6	7	9	3	3	5	5
Number of institutions	2	5	12	6	7	8	3	3	4	4

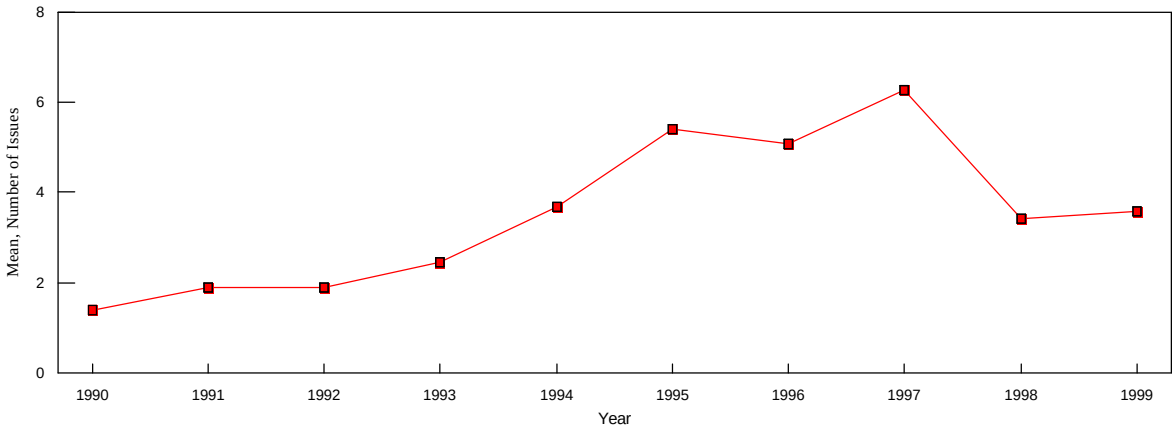
TABLE 4. CHARACTERISTICS OF SUBORDINATED DEBT ISSUES WITH ISSUE SIZES LESS THAN $75 MILLION FOR THE 50 LARGEST BANKING ORGANIZATIONS ANNUAL DATA, 1990-1999

CHARACTERISTICS	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Callable (in percent)										
No		100			0	7	14	2	3	10
Yes		0			100	93	86	98	97	90
Maturity (in percent)										
Less than 10 yrs.		33			50	36	3	2	3	0
10 yrs.		17			47	13	8	22	6	29
10-20 yrs.		50			3	51	85	74	87	71
More than 20 yrs.		0			0	0	3	2	3	0
Coupon frequency (in percent)										
Zero		0			0	0	0	0	0	9
Semi-annual		100			3	27	17	8	54	26
Quarterly		0			0	0	3	6	3	10
Monthly		0			97	73	79	86	42	55
Amount issued ($ millions)										
Minimum		10			1	1	1	3	2	10
Maximum		55			11	75	60	66	50	55
Mean		41			4	15	14	19	22	30
Median		50			4	12	10	15	25	25
Rate type (in percent)										
Fixed		100			100	100	97	100	97	100
Floating		0			0	0	3	0	3	0
Total issues per year	0	6	0	0	34	70	59	50	31	31
Number of institutions	0	4	0	0	2	6	6	4	7	4

Issuance Frequency

Market participants also perceive that liquidity -- and subordinated debt spreads more generally -- partly reflect the extent to which the market is familiar with an issuer and the amount of time that has passed since issuance. Because the market is likely to be more familiar with frequent issuers, such a perception may help explain why there has been an upward trend in the per annum average number of subordinated debt issues per holding company among the 50 largest holding companies that issued that type of debt (figure 1). This perception may also explain why it appears that issuers that have issued subordinated debt in the previous six-month period are more likely to issue it again, although issuance spreads do not appear to be statistically or economically affected by the frequency of issuance.[11] One should note, however, that while the average number of issues has risen among those that issue, the heterogeneity among issues has increased with the recent trend toward smaller-size issues (see table 4).

FIGURE 1. ANNUAL AVERAGE NUMBER OF ISSUES PER HOLDING COMPANY THAT ISSUES SUBORDINATED DEBT
ANNUAL DATA, LARGEST 50 U.S. BANK HOLDING COMPANIES



Data Quality

There is a consensus among market participants and researchers that accurate historical data on corporate bond prices are difficult to come by. The two sources of generally available price quotes are exchange prices (e.g., the New York or American Stock Exchanges) and

[11]See D.M. Covitz, D. Hancock, and M.L. Kwast, 2000, "Mandatory Subordinated Debt: Would Banks Face More Market Discipline?" Working Paper, Board of Governors of the Federal Reserve System, Washington, D.C., June.

institutional prices from major over-the-counter dealers (e.g., Goldman Sachs, Lehman Brothers, and Merrill Lynch). Exchange prices primarily reflect the odd-lot activities of individual investors, cover only a limited number of bond issues, and are based on a negligible portion of total trading activity. Institutional data -- often obtained indirectly through services such as Bloomberg Financial Markets -- cover a larger number of bonds and offer prices at which large positions could have been or indeed were transacted. In many cases, however, these prices are so-called "matrix prices," which are constructed using spreads over either an actively traded benchmark security issued by the same company, another company's issue with similar characteristics, or a U.S. Treasury issue. Between these two extremes, some commercial bond pricing services provide a mix of exchange and matrix prices. For example, Standard & Poor's, Moody's, and Interactive Data Corporation prioritize their data sources, so that they report exchange-based prices when they are available, but fill in the data series with either an institutionally based matrix bid price or a dealer bid quote when a bond does not trade for a week or more.[12]

The factors that drive secondary market liquidity for subordinated debt issued by depository institutions also appear to influence the comparability of market data from alternative sources. Weekly and daily subordinated debt price data were collected from two vendors -- Bloomberg and Interactive Data Corporation -- from January 1997 to October 1999 in order to calculate spreads over comparable maturity Treasury securities on 265 issues that were issued by 40 bank holding companies.[13] Over the time period studied, agreement about subordinated debt spreads across the two sources was greatest on issues with relatively large issuance size, and/or issues that had been recently issued. This agreement was particularly strong for the largest and most recent bonds issued by the 20 largest complex banking organizations. In addition, there

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[12]See Arthur Warga and Ivo Welch, 1993, "Bondholder Losses in Leveraged Buyouts," *Review of Financial Studies*, Volume 6, Issue 4, pp. 959-982, for an example where there are significant time-series differences between trader quotes, institutional data, and data based on a mix of exchange prices and matrix prices.

[13]Each spread was calculated from reported bond prices from each source using derived yields on each bond calculated by the Newton-Ralphson interactive method and an interpolated Treasury yield curve of the same maturity. This yield curve was identified for each month by using a smoothing spline of the forward rate curve, which is described in M. Fisher, D. Nychka, and D. Zervos, 1994, "Fitting the Term Structure of Interest Rates with Smoothing Splines," Working Paper, Board of Governors of the Federal Reserve System, September.

was considerable agreement across these data sources in *relative* subordinated debt spreads such that the rankings of bank holding companies by spreads are fairly consistent with one another, particularly for the lowest and highest spreads. Moreover, the agreement on rankings of spreads calculated using different vendor prices increased substantially when one only considered recently issued bonds (i.e., bonds issued within three years) by the 20 largest complex banking organizations.[14] Data consistency across vendors was also affected by the overall liquidity of the bond market. In particular, the comparability of subordinated debt spreads across vendors appears to have declined after the Russian default in August 1998.[15]

Because market participants indicated that vendor data may be suspect, to the point that they typically called at least five dealers for their current quotes, daily spreads were also collected from two broker-dealers in the subordinated debt market -- Merrill Lynch and Chase Securities -- on specific dates from January 1997 to December 1999, but on a more limited sample of bonds that were issued by only a small subset of the 40 bank holding companies. As expected, broker-dealer subordinated debt spread data were consistent with each other. In some cases, broker-dealer data were available on specific bonds on dates where vendor data were unavailable, but it was unclear whether the broker-dealer data were based on arms-length transactions, rather than on matrix-based pricing methods. Statistical analysis suggested that the broker-dealer spread data were by and large consistent with (i.e., highly and statistically correlated with) vendor data. This finding suggests that publicly available vendor data would be useful for indirect market discipline purposes, particularly during normal bond market conditions.

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[14]Both Spearman and Kendall (tau-b) correlation coefficients were used to measure the association between spreads from alternative vendor sources. The former measure is concerned with differences in absolute rankings, putting the highest weight on spreads at the extremes, whereas the latter measure captures differences in relative rankings. These measures indicated that there was greater agreement about which bank holding companies had spreads at the extremes than there was about the rankings of holding companies in the middle range of the spread distribution.

[15]See D. Hancock and M.L. Kwast, 2000, "Using Subordinated Debt to Monitor Bank Holding Companies: Is it Feasible?" Working Paper presented at a Conference on Incorporating Market Information into Financial Supervision sponsored by the Federal Deposit Insurance Corporation and the Journal of Financials Services Research, November 9, 2000.

Issuance prices on subordinated bonds were collected from several sources including Bloomberg historical data, Warga-Lehman Brothers Fixed Income Database, and rating agencies (Moody's and Fitch-IBCA). Issuance prices for the same bond across these data sources were almost always identical and when they differed it implied only a few basis point difference in the calculated spread over Treasury securities with comparable maturities.

Going forward, the quality and availability of bond prices will likely improve as fixed-income market players develop new systems for trading, underwriting, and distributing bonds as well as the dissemination of their market research to institutional investors. By early 2000, there were 39 on-line trading and underwriting systems in operation or in development.[16] Such new systems may not only improve bond market efficiency, but also provide direct access for retail investors, increase transparency and liquidity, and lower the cost of data collection for prices, trading volumes, and bid-ask spreads.

Factors Affecting Issuance Decisions

In the existing market, it appears that various factors influence the decisions of depository institutions and depository institution holding companies to issue subordinated debt. First, organizations gauge the market carefully in order to choose an opportune time to issue subordinated debt. Typically, a shelf registration is used to allow flexibility in the timing of issuance.[17] This flexibility is used both to fulfill financing needs and to be able to speedily tap the market when market conditions are judged to be "just right." Market conditions are typically assessed by issuers using the spread of their debt over a benchmark rate of interest (e.g., libor or comparable maturity Treasury securities) or their debt spread relative to spreads being paid by a peer group of institutions. Second, potential issuers of subordinated debt consider the types of information that would need to be publicly disclosed when they are deciding to issue such debt. In some circumstances, market participants indicated that some organizations may choose to

[16]See Robert Clow, 2000, "After Sitting Out the First Wave of the Internet Revolution, the Fixed Income Market is Eyeball to Eyeball with the Future," *Institutional Investor,* February, pp. 41-44.

[17]Starting in 1982, the Securities and Exchange Commission allowed firms to register securities in advance of issuance under Rule 415. With such a shelf registration, securities may be sold up to two years later. With securities "on the shelf," the firm can require investment bankers to bid competitively, merely refusing to sell when desirable bids are not forthcoming.

shrink assets rather than make an unwanted disclosure. And third, some organizations argue that exposure to institutional investors, and the market more generally, is important. Large "benchmark" issues can create a favorable impression of an issuer, lower issuance costs, and increase market demand and liquidity because an organization can increase its name recognition. In addition, some depository institutions perceived that their market welcome had become worn when they came to the market with several smaller issues in rapid succession. As a consequence, some issuers are evolving toward somewhat fixed intervals between issues. At the same time, it is not uncommon for the largest depository institutions to issue subordinated debt four or five times per year (see figure 1).

Underwriting Fees and Related Issuance Costs

Subordinated debt issuance costs for depository institutions are quite low compared to their equity issuance costs for all large depository institution holding companies.[18] The study group for this report collected and analyzed data on issuance costs (including underwriting, legal, accounting, and other fees and expenses) from the Securities Data Company for stock and bond issues that were made during the 1995-99 period. For the largest 50 bank holding companies, such data were available on 11 stock issues and 85 subordinated debt issues. Since subordinated debt issues have finite maturities and equity issues do not, it was assumed that each bond issue would be rolled over at its maturity with a new bond of the same maturity, yield, and issuance costs, in perpetuity. The average of the ratios of issuance costs to issue size (including discounted future expected issuance costs that were computed by using the yield on each bond at its offering date) for the 85 subordinated debt issues was 1.28 percent.[19] This ratio was considerably lower than the average of the ratios of issuance costs to equity issue size calculated for the 11 stock issues, which was 2.45 percent.[20]

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[18]See also U.S. Shadow Regulatory Committee, 2000, "Reforming Bank Capital Regulation: A Proposal by the U.S. Shadow Regulatory Committee," The AEI Press, Washington, D.C., March, p.39. For a sample of banks and bank holding companies with assets greater than $10 billion over the 1995-99 period, these authors calculated an average per dollar subordinated debt issuance cost (including discounted future expected issuance costs) of 1.53 percent and an average per dollar equity issuance cost of 3.46 percent.

[19]An issue-size weighted average of these ratios was slightly lower at 1.21 percent.

[20]An issue-size weighted average of these ratios was slightly lower at 2.20 percent.

The propensity to issue debt relative to equity does not appear to be highly correlated with the per dollar issuance costs of debt relative to equity. The ratio of issuance costs to subordinated debt issuance size was on average slightly lower for the 20 bank holding companies with the largest total assets than it was on average for the next 30 largest bank holding companies (1.26 percent vs. 1.38 percent). However, such ratios are not statistically different from one another.[21] At the same time, the ratio of issuance costs to equity issue size was significantly smaller for the 20 largest bank holding companies than for the next 30 largest bank holding companies (2.04 percent vs. 2.94 percent).[22] Thus, the per dollar issuance cost difference between subordinated debt and equity is statistically smaller for the largest 20 bank holding companies, than for the bottom 30 of the top 50 bank holding companies. If such relative costs were a determining factor in a banking organization's decision to issue subordinated debt, then it would be expected that smaller banks would be more likely to issue subordinated debt than would larger banks. However, the opposite has been found by researchers to date -- that is, larger banks are more likely to issue subordinated debt than are smaller banks, holding other things constant.[23] Both findings together lend considerable credence to issuer views that issuance costs were not a determining factor in their decision to issue subordinated debt.[24]

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[21]Since top 20 bank holding companies tend to issue larger-size issues than do bank holding companies ranked in the bottom 30 of the top 50 bank holding companies, this finding suggests that the ratio of issuance costs to issuance size does not vary much by subordinated debt issue size.

[22]Despite the small number of observations, the average ratio of issuance cost to issuance size for equities was statistically different for these two groups of bank holding companies at either the 5 percent or 10 percent level of confidence. This finding suggests that equity issuance costs have a fixed cost component to them.

[23]See D.M. Covitz, D. Hancock, and M.L. Kwast, 2000, "Mandatory Subordinated Debt: Would Banks Face More Market Discipline?" Working Paper, Board of Governors of the Federal Reserve System, June.

[24]See Board of Governors of the Federal Reserve System, 1999, "Using Subordinated Debt as an Instrument of Market Discipline," Staff Study 172, Washington, D.C., December, p.45.

Regulatory Capital

Existing regulatory capital guidelines allow for some substitution of subordinated debt for equity in the definition of *total regulatory capital.* The combined maximum of subordinated debt (excluding mandatory convertible debt) and intermediate-term preferred stock that may be treated as tier 2 capital is limited to 50 percent of tier 1 capital.[25] Qualifying subordinated debt for tier 2 capital must not contain provisions that permit debt holders to accelerate payment of principal prior to maturity (except in the event of bankruptcy or of the appointment of a receiver for the issuing bank);[26] must not contain or be covered by any covenants, terms, or restrictions that are inconsistent with safe and sound banking practice;[27] must not be credit sensitive;[28] and must have an original weighted average maturity of at least five years.[29, 30]

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[25]Combined amounts in excess of 50 percent of tier 1 capital may be issued by a bank, but such amounts are not included in the total risk-based capital ratio calculation. Amounts in excess of the limit are taken into account in the overall assessment of a bank's capital adequacy and financial condition.

[26]For example, subordinated debt would not qualify as tier 2 capital if there are terms in the debt contract that would allow the debt holders to accelerate payment if the bank failed to maintain certain prescribed capital ratios or rates of return, or if the amount of non-performing assets or charge-offs of the bank exceeded a certain level. Such terms are not allowed because the repayment of debt could be accelerated at a time when the bank is experiencing difficulties and could impinge on the ability of the bank to resolve its problems in the normal course of business. Further, such acceleration clauses could not allow the subordinated debt holders to be paid ahead of general creditors or deposits, thereby calling into question whether such debt is actually subordinated. See 12 C.F.R. §250.166 "Treatment of Mandatory Subordinated Debt and Subordinated Notes of State Member Banks and Bank Holding Companies as Capital."

[27]Terms that could adversely affect liquidity or unduly restrict the management's ability to run the bank, particularly in times of financial difficulty, are not allowed in capital instruments. See ibid.

[28]That is, future interest payments on subordinated debt included in capital may not be linked to the financial condition of the institution. For example, there cannot be a mandate for an increase in the rate of interest as the credit rating of the bank declines, or an auction rate mechanism, or an increase in interest rate if payment is not made in a timely fashion. See ibid.

[29]Outstanding amounts of subordinated debt that count as supplementary capital include 100 percent of the outstanding amounts with remaining maturities of more than five years; 80 percent of outstanding amounts with remaining maturities of four to five years; 60 percent of outstanding amounts with remaining maturities of three to four years; 40 percent of outstanding amounts with remaining maturities of two to three years; 20 percent of outstanding amounts with remaining maturities of one to two years; and zero percent of outstanding amounts with

Table 5 presents some information for each of the 50 largest U.S. bank holding companies that is relevant for understanding whether currently outstanding subordinated notes and debentures would or could potentially qualify for regulatory capital purposes. In this table, each holding company, identified by both its entity number (column 2) and name (column 3), is ranked by its total asset size (column 4). Because the total regulatory capital ratio and the tier 1 and tier 2 regulatory capital ratios are based on risk-weighted assets, these assets are presented in column 5. Column 6 provides for each holding company the estimated percentage of assets that are banking assets. The tier 1 regulatory capital ratio for the holding company is presented in column 7. Whereas column 8 presents the ratio of total outstanding subordinated notes and debentures to risk-weighted assets for each holding company, column 9 contains the ratio of "qualifying" subordinated debt to risk-weighted assets. The qualifying subordinated debt-to-risk-weighted asset ratio weights each outstanding issue according to its remaining maturity as of December 30, 1999.[31]

An examination of table 5 suggests the following. Suppose that the subordinated debt requirement is set at 2 percent of risk-weighted assets -- an amount specified in many subordinated debt proposals.[32] First, 75 percent of the top 20 banking organizations have enough subordinated debt outstanding (unweighted) to comply with a subordinated debt requirement of 2 percent of risk-weighted assets. As one moves down the ranks, however, a smaller proportion of bank holding companies would currently be able to comply with such a requirement. Second, the amortization rule for a banking organization's outstanding subordinated debt, which is contained in regulatory capital guidelines, implies that "qualifying" subordinated debt can be

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remaining maturities of less than one year. Thus, subordinated debt instruments with a remaining maturity of less than one year are excluded from tier 2 capital. If the bank desires to redeem subordinated debt before the stated maturity, then it must receive prior regulatory approval.

[30]These criteria for qualifying subordinated debt have likely increased the homogeneity of instrument characteristics offered by banking organizations. Puttable notes are virtually eliminated from qualifying as tier 2 capital, since the capital guidelines define the maturity of a subordinated debt instrument for risk-based capital purposes as "the earliest possible date on which a holder can put the instrument back to the issuing bank."

[31]The weights on outstanding subordinated debt issues are defined in footnote 29.

[32]See appendix A.

considerably less than total outstanding subordinated debt (compare column 9 data with column 8 data). This means that some holding companies that now have subordinated debt outstanding of at least 2 percent of risk-weighted assets would be unable to include some portion of their subordinated debt that is now outstanding in the calculation of their total regulatory capital ratio. However, even if only qualifying subordinated debt were used in the calculation of a 2 percent subordinated requirement, no holding company would currently fall below the 2 percent threshold. Third, 2 of the largest 50 bank holding companies (HSBC (rank 11) and National City Corporation (rank 12)) have qualifying subordinated debt outstanding that is ineligible for inclusion in tier 2 capital because the qualifying subordinated debt-to-risk-weighted assets ratio is greater than 50 percent of their tier 1-to-risk-weighted assets ratio. Such organizations could, of course, potentially use such subordinated debt issues for tier 2 regulatory capital purposes by increasing their tier 1 capital. In addition, there are a few holding companies that have qualifying subordinated debt that is almost equal to 50 percent of their tier 1-to-risk-weighted assets ratio. This means that such organizations would not be able to count some of their qualifying subordinated debt outstanding if they increase their risk-weighted assets without increasing their tier 1 capital. Hence, the existing regulatory capital guidelines can importantly affect whether each new subordinated debt issue made by a banking organization will boost its regulatory capital ratios.[33]

[33]Of course, the definition of regulatory capital could be changed to more easily accommodate subordinated debt. However, current Basel Accord reform efforts do not contemplate such changes.

TABLE 5. THE 50 LARGEST U.S. BANK HOLDING COMPANIES BY TOTAL ASSETS, DECEMBER 31, 1999

Rank (1)	Entity (2)	BHC name (3)	Total assets (in millions) (4)	RWA (in millions) (5)	Bank Assets/ BHC Assets (6)	Tier 1/ RWA (7)	SND/ RWA (8)	Qualifying SND/RWA (9)
1	1951350	Citigroup	716,937	493,889	35.88	9.66	1.50	1.36
2	1073757	Bank Of America Corporation	632,574	525,383	91.33	7.27	3.05	2.30
3	1039502	Chase Manhattan Corporation	406,105	301,584	89.57	8.46	2.88	2.43
4	1068294	Bank One Corporation	269,425	262,973	90.10		2.79	2.21
5	1037115	J P Morgan & Company, Inc.	260,898	131,346	49.68	8.79	4.67	3.96
6	1073551	First Union Corporation	253,024	200,806	93.94	7.07	3.35	2.88
7	1120754	Wells Fargo & Company	218,102	167,112	89.91	7.98	1.55	1.13
8	1113514	Fleetboston Financial Corporation	190,692	189,650	89.08	6.73	3.52	3.08
9	2816906	Taunus Corporation	178,531	94,704	3.13	1.67	3.65	0.84
10	1131787	Suntrust Bank, Inc.	95,390	88,561	95.34	7.32	1.55	1.39
11	2872407	HSBC North America	90,240	52,345	82.09	9.14	8.27	4.69
12	1069125	National City Corporation	87,121	73,027	96.91	6.61	4.35	3.31
13	1068025	KeyCorp	83,344	82,097	96.99	7.68	3.29	2.84
14	1119794	U S Bancorp	81,530	83,196	94.97	6.74	3.55	3.19
15	1069778	PNC Bank Corporation	75,428	67,118	90.58	7.05	3.32	3.04
16	1033470	Bank of NY Company, Inc.	74,756	66,041	97.23	7.51	4.13	3.16
17	2724645	Firstar Corporation	72,788	65,555	99.17	8.13	1.58	1.61
18	1136157	Wachovia Corporation	67,353	77,059	95.19	7.52	2.97	2.73
19	1022353	Abn Amro North America, Inc.	63,743	45,411	23.63	7.14	2.41	2.41
20	1111435	State Street Corporation	60,899	21,186	99.40	14.72	0.01	0.01
21	1068762	Mellon Financial Corporation	48,227	46,569	93.71	6.60	4.72	3.30
22	1074156	BB&T Corporation	43,481	30,595	96.64	9.30	2.80	2.48
23	1078604	Amsouth Bancorporation	43,427	37,119	…	7.46	2.36	2.22
24	1079441	Southtrust Corporation	43,263	36,888	99.87	6.65	2.78	2.56
25	1078332	Regions Financial Corporation	43,005	29,725	…	9.39	0.83	0.70
26	1245415	Bankmont Financial Corporation	42,246	25,235	67.68	10.05	2.50	2.18
27	1070345	Fifth Third Bancorp	41,590	33,368	99.35	12.16	0.74	0.74
28	1199844	Comerica, Inc.	38,664	45,717	…	6.95	2.93	2.74
29	1033872	Summit Bancorp	36,411	26,648	98.73	9.46	0.84	0.37
30	1378434	UnionBanCal Corporation	33,684	33,288	98.66	9.94	0.90	0.60
31	1094369	Union Planters Corporation	33,280	22,512	100.00	9.50	2.11	1.98
32	1871159	MBNA Corporation	30,860	29,757	95.69	14.72	1.69	1.10
33	1068191	Huntington Bancshares, Inc.	29,037	25,299	99.63	7.53	2.76	2.02
34	1199611	Northern Trust Corporation	28,708	22,320	100.00	9.91	2.80	2.53
35	1129382	Popular, Inc.	25,461	15,346	…	10.16	0.81	0.81
36	1199497	Marshall & Ilsley Corporation	24,370	17,932	98.49	11.08	0.56	0.33
37	1132449	Citizens Financial Group	23,190	18,021	…	7.17	2.38	2.36
38	1024058	First Society Corporation	22,993	19,552	98.34	8.61	1.02	1.89
39	1037003	M&T Bank Corporation	22,409	17,930	100.00	8.32	0.98	0.73
40	1027004	Zions Bancorporation	20,283	14,587	99.63	8.64	1.56	1.35
41	1094640	First Tennessee National Corporation	18,375	13,884	99.76	8.70	2.19	2.19
42	1078529	Compass Bancshares, Inc.	18,219	14,354	…	8.10	2.77	2.49
43	1199705	Old Kent Financial Corporation	17,987	13,874	…	9.14	0.72	0.72
44	1074660	Allfirst Financial Inc	17,520	14,926	99.38	9.81	2.73	2.31
45	1025608	Bancwest Corporation	16,681	14,754	84.18	8.80	1.37	0.68
46	1078921	Hibernia Corporation	15,314	11,788	…	10.20	0.00	0.00
47	1025309	Pacific Century Fncl Corporation	14,441	11,463	100.00	10.30	2.12	1.71
48	1249196	Peoples Heritage Financial Group	13,911	8,200	100.00	11.11	0.00	0.00
49	1199563	Associated Banc-Corporation	12,520	8,559	99.62	9.72	0.00	0.00
50	1048429	North Fork Bancorp	12,108	7,077	…	11.47	0.00	0.00

B. Are the Objectives of a Mandatory Subordinated Debt Requirement Achievable?

With the previous section as background, this section evaluates whether a subordinated debt policy could be designed and implemented that would be likely to achieve one or more of the five objectives that were identified in the introduction, namely (1) improving direct market discipline; (2) augmenting indirect market discipline imposed by private parties and/or supervisors; (3) improving transparency and disclosure; (4) increasing the size of the financial cushion for the depositor insurer; and (5) reducing regulatory forbearance.

Improved Direct Market Discipline

Direct market discipline is exerted through debt instruments when expected funding costs are sufficiently risk-sensitive that the anticipation of higher funding costs provides an incentive *ex ante* for the depository institution to refrain from excessive risk-taking. This definition implies that (1) expected funding costs are risk sensitive, and (2) these costs must be significant enough to actually influence managerial actions.

If expected funding costs are risk sensitive, then one way that such costs might actually influence managerial actions is by affecting subordinated debt issuance decisions. Two studies (Board of Governors of the Federal Reserve System, 1999; Covitz, Hancock, and Kwast, 2000) have considered whether issuance decisions by the largest 50 banking organizations are risk sensitive. In addition, Hancock, Covitz and Kwast (2000) analyzed whether issuance spreads for subordinated debt are risk sensitive. Because the risk sensitivity of funding costs may vary over time, these studies consider a series of two-year periods. These studies find that neither issuance decisions nor issuance spreads were statistically risk sensitive in the 1986-87 period. This finding is consistent with the unresponsiveness of secondary market subordinated debt spreads to banking organization-specific risk, which has been reported by numerous studies that have considered the mid-1980s period.[34]

[34]See appendix C for a summary of empirical studies on the effectiveness of market discipline exerted by uninsured liabilities on banking organizations.

In contrast, during 1988-91 -- a time of considerable banking distress -- riskier banking organizations were found to be less likely to issue subordinated debt. Additionally, issuance spreads were found to be risk sensitive during that period. These findings suggest that the 50 largest banking organizations were subject to direct market discipline during 1988-91.

Banking conditions improved during 1992-95. Although expected issuance spreads continued to be statistically risk sensitive during 1992-95, the *relatively* risky banking organizations continued to issue subordinated debt. These findings suggest that the degree of direct discipline exerted on banking organizations wanes during prosperous periods. Buttressing this view is the finding that the issuance decision again became risk sensitive during the 1996-97 period, a period during which it became apparent that the financial crisis in Asia would affect the earnings of some U.S. banking organizations. Issuance prices were sufficiently risk sensitive that the most risky banking organizations again chose not to issue subordinated debt. In sum, it appears that since the late 1980s direct market discipline tends to exert itself through the subordinated debt markets mostly during periods of banking distress or when bond markets are in turmoil.

Although direct market discipline may be imposed on depository institutions whenever they choose to issue risk-sensitive debt instruments, a policy that *requires* regular issuance would, in principle, enhance direct market discipline. This is because required issuance ensures that a depository institution would incur a higher cost of funds if it chooses to increase its risk, holding other things constant, an outcome that enhances direct market discipline. However, research to date has been unable to quantify the potential benefits from this extra market discipline relative to its costs.

Augmented Indirect Market Discipline

Indirect market discipline is exerted through risk-sensitive debt instruments when (1) private parties or government supervisors monitor secondary prices of that instrument to assess the riskiness of a depository institution, and (2) such parties then take actions in response to a perceived increase in depository institution risk. For the price of a depository institution's debt to be risk sensitive, investors must perceive that they will not be bailed out by the government should the depository institution fail.

Evidence from academic studies suggests that the risk sensitivity of secondary market subordinated debt spreads, a necessary condition for indirect market discipline, has varied over time, particularly relative to other uninsured liabilities such as large certificates of deposit. Indeed, early market discipline studies can be categorized into two separate phases: (1) those that considered the risk sensitivity of spreads over Treasury securities with comparable maturities using pre-1987 data on uninsured liabilities, and (2) those that considered the risk sensitivity of such spreads using post-1987 data.[35] Appendix C presents a summary of each of these empirical studies, including their bibliographic citation, information on sample characteristics that includes the period considered and whether banks and/or bank holding companies (BHCs) were studied, the uninsured liability type, relevant empirical findings, and an indication of whether the evidence is consistent with market discipline being exerted on the banking organizations included in each sample.

Using pre-1987 data, many studies found that spreads on large uninsured certificates of deposit were risk sensitive (Baer and Brewer, 1986; Cargill, 1989; Hannon and Hanweck, 1988; James, 1987, 1988; Keeley, 1990; Ellis and Flannery, 1992). In contrast, there were studies that could not find a relationship either between option-adjusted subordinated debt spreads and banking organization-specific risk measures (Avery, Belton, and Goldberg, 1988), or between derived contingent claims prices on subordinated debt and banking organization-specific risk measures (Gorton and Santomero, 1990). These results have long been considered puzzling at best, because presumably subordinated debt holders would have had *less* access to the public safety net than would uninsured depositors.[36]

Using post-1987 data, however, many researchers have found evidence that secondary market subordinated debt yield spreads have become risk sensitive. Indeed, at least six studies (DeYoung et al., 1998; Flannery and Sorescu, 1996; Hassan, 1993; Hassan, Karels, and

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[35]It should be noted that 1987 is a somewhat arbitrary cutoff driven by the timing of research studies. Evidence discussed below indicates that market discipline strengthened in the late 1980s.

[36]Indeed, the depositor preference laws that were subsequently enacted in the U.S. support this view.

Peterson, 1993; Jagtiani and Lemieux, 1999; and Jagtiani, Kaufman, and Lemieux, 1999) summarized in appendix C) have found secondary market subordinated debt spreads over comparable maturity Treasury securities for bank-issued debt and/or for BHC-issued debt to be risk sensitive in the post-1987 period.

At the same time, there is a lack of consensus among recent studies that have considered the risk sensitivity of large certificates of deposit spreads. Two studies (Jagtiani and Lemieux, 1999; Jordan, 2000) have considered the risk sensitivity of uninsured deposit spreads in the period just before a bank fails.[37] Although the Jordan study, which considered only New England banks, found some evidence that spreads on large certificates of deposit generally rose as each bank's condition deteriorated, the Jagtiani and Lemieux study did not find evidence of rising uninsured certificate of deposit rates near the failure dates for the banks included in their sample. The conflicting results of these two studies suggest that such deposits may not provide useful yields for monitoring the condition of troubled large banks.

Given the empirical evidence that subordinated debt spreads are risk sensitive, it is, perhaps, not surprising that market participants indicated that they closely follow such spreads. Generally, a depository institution's spread movements relative to a peer group of institutions were viewed as important signals of a change in the perceived credit quality of the institution. In addition, subordinated debt spread movements were perceived as having value added relative to stock price movements and estimated default frequencies computed therefrom.[38] Moreover, these data are used in setting credit limits, and for buy and sell decisions with respect to an institution's debt.

Having said this, all market participants felt that subordinated debt spreads need to be interpreted with care. First, daily fluctuations in such spreads can be driven by so-called technical factors, such as shortages and surpluses in particular issues. Second, bond market

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[37]These studies are also summarized in appendix C.

[38]The study group considered the time-series properties of subordinated debt spreads and of estimated default frequencies that were calculated using the KMV model for the 20 largest complex banking organizations. Statistically and visually significant differences in these data time-series were found over the 1995-2000 period.

stress can dry up liquidity for all bonds issued by depository institutions, as well as for other corporate issues. And third, debt spreads tend to widen during economic downturns and narrow during economic upturns.

On balance, the findings of academic studies on the risk sensitivity of subordinated debt spreads and the use of such spreads by market participants for the assessment of relative credit risks together imply that the subordinated debt market has exerted some indirect market discipline on large depository institutions in the post-1987 environment. Moreover, it appears that this indirect market discipline operates through changes in *relative* spreads, or changes in the *rankings* of depository institutions by spreads, since the absolute levels of spreads depend on many non-idiosyncratic factors (e.g., bond market conditions and the stage of the business cycle).

Current Uses of Subordinated Debt Market Information by Bank Supervisors

Given these findings, it is not surprising that bank supervisors have been using, and continue to use, such spreads to monitor depository institutions. For example, since 1993 the Office of the Comptroller of the Currency (OCC) has monitored secondary subordinated debt spreads for 25 large bank holding companies that are either parents of money center banks or that are parents of banks in their large bank program.[39] Each quarter, the spreads for these holding companies are (1) ranked from largest to smallest subordinated debt spread, (2) compared to bank bonds with similar ratings, and (3) compared with corporate bonds rated A3. A quarterly report with this information -- together with examiner ratings, KMV estimated default ratings derived from the holding company's equity market data, a discussion about changes in rankings, and information on recent changes in the subordinated debt market -- is distributed to senior OCC officials, examiners in charge, and field examiners at large banks. This information is used in the field examiner's assessment of the bank's liquidity risk. On

[39]Holding company data are used because publicly issued subordinated debt is generally issued by the parent holding company, rather than by the bank. Data are currently obtained from the Bloomberg financial markets database, but were originally directly collected from professional bond traders. At present, spreads are calculated over libor swap rates. Prior to June 2000, however, spreads were calculated using Treasury securities with comparable maturities.

average, changes in subordinated debt spreads, either absolutely or relative to peer banks, lead to about three to four discussions per quarter between field examiners and OCC headquarters staff in the Treasury and Market Risk Division, who are responsible for distributing the market information report. In some cases, these discussions have led to closer, more intensive (e.g, weekly, daily, or twice-daily) monitoring of spreads, which in turn resulted in more formal monitoring of the bank and discussions with the bank's management. In all such cases, subsequent monitoring and supervisory actions have depended on supervisory assessments of the bank's condition.

Similarly, the Federal Reserve monitors monthly changes in rankings and absolute changes in subordinated debt spreads for large complex banking organizations together with both estimated default frequencies derived from equity market data and ratings information. In several instances, the debt and equity markets have appeared to disagree about the condition of a bank holding company and this has prompted considerable discussion about the comparability of signals from these markets and the underlying assumptions of the models used to derive estimated default frequencies from equity market data.

From a supervisory perspective, the jury is still out on whether the equity market or the debt market supplies better signals for the probability of default for depository institutions and their holding companies. Debt spreads do appear to start rising as much as six quarters prior to the failure of a depository institution, and this suggests that bond market spreads could be useful to bank supervisors as a warning signal from financial markets.[40] Stock market data, however, appear to be more useful than are subordinated debt spreads in predicting when supervisors will move a bank to a riskier examination rating.[41]

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[40]See J. Jagtiani and C. Lemieux, 2000, "Stumbling Blocks to Increasing Market Discipline in the Banking Sector: A Note on Bond Pricing and Funding Strategy Prior to Failure," Emerging Issues Series, S&R-99-8R, Supervision and Regulation Department, Federal Reserve Bank of Chicago.

[41]See G. A. Seale and E. Bloecher, 2000, "Using Market Information to Improve the FDIC's Off-site Monitoring of Banks," Discussion Paper, Federal Deposit Insurance Corporation, September.

Unfortunately, the interpretation of subordinated debt spreads has been made more complex by several bond market developments. First, liquidity in the bond market has not returned to the level observed before the Russian default. Second, reduced Treasury financing needs have lowered the supply of on-the-run Treasury securities at the longer end of the maturity spectrum, which are precisely the maturities typically issued by depository institution holding companies in the subordinated debt market. And third, bank holding companies dramatically reduced the number of subordinated debt issues over 1998 and 1999, and at the same time some holding companies have greatly increased the *size* of their issues at least partly in response to market demand for more liquid issues. Such developments have affected the time-series movements of subordinated debt spreads, and possibly cross-sectional rankings of debt spreads, thereby making their interpretation more art than science not only for bank supervisors, but also for other third parties that would apply indirect market discipline to depository institution holding companies and their affiliated depository institutions.

Improved Transparency and Disclosure

Some subordinated debt market participants interviewed by the study group claimed that substantially more information is revealed to the subordinated debt market at issuance. It was their perception that issuance compels disclosure to the market of information about a depository institution's current condition and prospects, and such disclosures refresh secondary market prices and enhance indirect market discipline. Other market participants suggested that new issues do not bring new disclosures if the subordinated debt issue is taken from an earlier shelf registration.

The small amount of research that has examined this issue generally supports the view that new issues reveal new information. To ascertain whether there is empirical evidence of a disclosure and screening effect surrounding the issuance of subordinated debt by bank holding companies, Covitz and Harrison (2000) considered the implications of a disclosure and screening process with respect to the timing of subordinated debt issuance, and then tested for the timing

effects.[42] To see the possible impact of disclosure and screening on the timing of subordinated debt issuance, consider first the situation where debt issuers privately know their default risk, and in which the disclosure and screening acts independently of the issuance process. In this case, firms with low unobserved risk may have an incentive to *delay* issuance until their positive private information is revealed to the market.[43] In contrast, if it is assumed that the issuance process helps debt-issuers convey their true default risk to the market, firms with low unobserved risk may *issue* to reveal that information.

To test whether bank holding companies with positive information about their current and potential condition are coming to the market to reveal that information, Covitz and Harrison examined Moody's rating and debt issuance patterns for U.S. bank holding companies. Their preliminary findings are consistent with the view that the debt issuance of financial firms is motivated, at least in part, by the desire to disclose positive information. First, they found that ratings changes peak around issuance -- which suggests that issuance is associated with the revelation of new information. Second, the direction of these changes, both immediately prior to and subsequent to issuance, is positive. That is, on average, bank holding companies appear to issue in order to reveal "good news" to the market. These findings are robust to statistical controls for initial ratings, financial variables, regulatory capital ratios, and macroeconomic factors.

In addition, Covitz and Harrison found that positive ratings changes are more likely for bank holding companies that issue subordinated debt. This result suggests that there is more information revealed in the issuance of subordinated debt than in the issuance of other liabilities.

Increased Size of the Financial Cushion for the Depositor Insurer

It seems likely that a subordinated debt requirement would effectively increase the

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[42]Daniel M. Covitz and Paul Harrison, 2000, "Disclosure, Due Diligence, and the Strategic Timing of Bank Holding Company Debt Issuance," mimeo, Board of Governors of the Federal Reserve System, November.

[43]Daniel M. Covitz and Paul Harrison, 2000, "The Timing of Debt Issuance and Rating Migration: Theory and Evidence," *Finance and Economics Discussion Series*, 2000-10, Division of Research & Statistics and Monetary Affairs, Federal Reserve Board, January.

insurance deductible for the deposit insurance loss cushion by shifting some risk to the private sector in the event that a depository institution becomes insolvent. The issue is, however, quite complex. To understand why the size of the financial cushion for the deposit insurer is likely to increase -- at least when a subordinated debt requirement is imposed on a depository institution instead of on a depository institution holding company -- it is necessary to first understand the mechanics that underlie deposit insurance.

The set of depository institution funding sources that constitute the financial cushion for the deposit insurer (i.e., the deposit insurance loss buffer) are determined by the law governing the allocation of depository institution assets (including the deposit insurance guarantee) to depository institution creditors in the event that a depository becomes insolvent.[44] Under U.S. law, when a depository institution is designated insolvent, claimants holding collateralized obligations (e.g., repurchase agreements) come first, followed by administrative expenses associated with the allocation of a depository institution's assets. At the same time, the deposit insurer (i.e., the FDIC) compensates all insured domestic depositors and then shares third priority on the depository institution's assets with uninsured domestic depositors. This sharing of priority implies that the deposit insurer receives a portion, equal to the ratio of insured domestic deposits to total domestic deposits, of each dollar of the depository institution's assets until either the deposit insurer is repaid in full or the depository institution's assets are exhausted. The next group of claimants on the depository institution's assets are general creditors (e.g., foreign depositors, litigation claimants, lease claimants, and senior debt holders). The subordinated debt holders follow general creditors and equity holders follow subordinated debt holders.

Consequently, one measure of the deposit insurance loss buffer is the share of the depository institution's assets taken up by claimants with lower priority than the deposit insurer (i.e., foreign deposits, general creditors, subordinated debt holders, insolvent banks with cross-guarantee claims, and equity holders). For the remainder of this discussion, general creditors and cross-guarantee claimants are denoted as "other uninsured liability holders" for simplicity.

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[44]See 12 U.S. Code, 1821(d)(11).

Figure 2 below orders depository institution funding sources by their bankruptcy priority and indicates those funding sources that constitute the deposit insurance loss buffer.

FIGURE 2. DEPOSITORY INSTITUTION FUNDING SOURCES AND THE DEPOSIT INSURANCE LOSS BUFFER

1. Collateralized Obligations
2. Administrative Expenses of Receivership
3. Insured Deposits and Uninsured Domestic Deposits
4. Other Uninsured Liabilities
5. Subordinated Debt
6. Equity

Deposit Insurance Loss Buffer

Suppose that the amount of subordinated debt required by a policy is so small that a depository institution would want to hold more than the required amount even in the absence of the policy. Clearly, in this case the requirement would not influence the depository institution's funding choices, and therefore the deposit insurer loss buffer would remain the same as it would in the absence of the policy.

Alternatively, the amount of subordinated debt required by a policy could be larger than what would voluntarily be held in the absence of the policy. If the depository institution responds to such a policy by merely substituting subordinated debt for other sources of funding contained in the deposit insurance loss buffer (i.e., other uninsured liabilities and equity), then the deposit insurance loss buffer would again remain the same as it would in the absence of the policy.[45] However, if the depository institution responds to the policy by reducing collateralized

[45]Equity may provide a greater buffer to the deposit insurer than subordinated debt, since it is possible that a depository institution approaching insolvency may be unable to rollover subordinated debt as it matures. Regulatory capital guidelines and prompt corrective action criteria recognize this, since subordinated debt receives less capital credit as its maturity date nears and undercapitalized depository institutions are not allowed to make payments to subordinated debt holders (see below).

obligations or deposits, then the deposit insurance loss buffer would increase. The only case in which a subordinated debt policy would reduce the deposit insurance loss buffer would be where depository institutions over-compensate for the subordinated debt policy by reducing other uninsured liabilities and equity by even more than the increase in subordinated debts and increasing collateralized obligations or domestic deposits. This possibility is difficult to justify. Thus, a mandatory subordinated debt policy would not be likely to decrease the deposit insurance loss buffer at affected depository institutions.

Still, it is difficult to predict whether the deposit insurance loss buffer would actually increase after the implementation of a subordinated debt policy applied to depository institutions. On the one hand, it does not seem likely that depository institutions would increase the deposit insurance loss buffer by reducing their holdings of collateralized obligations or insured deposits. Collateralized obligations are relatively specialized instruments that have little in common with subordinated debt, and insured deposits are a relatively stable source of funds -- such stability arises because insured deposits are not very responsive to changes in deposit interest rates, and because they have synergies with lending activities that make them less substitutable for subordinated debt than are other funding sources. On the other hand, a depository institution might increase the deposit insurance loss buffer by reducing uninsured deposits. However, uninsured deposits and other uninsured liabilities (e.g., senior debt) are close substitutes in the firm's capital structure because they have similar tax benefits, similar effects on bankruptcy costs (i.e., they both increase the likelihood of bankruptcy), no regulatory capital benefits, and no obvious synergies with other lending activities (as was the case with insured deposits). Therefore, even if it were known that a depository institution would respond to a subordinated debt policy by reducing uninsured liabilities, it would not be possible to accurately predict whether uninsured deposits would actually decline.[46]

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[46]Whether a depository institution subject to a binding subordinated debt policy would reduce equity is not explored here. If a depository institution's only response to a subordinated debt policy was a reduction in equity, clearly the deposit insurance loss buffer would remain unchanged. If equity was reduced along with any uninsured liabilities it would still not be possible to accurately predict the impact on the deposit insurance loss buffer, since it would still not be possible to predict whether the form of any reduced uninsured liabilities would be

The possible effects of a subordinated debt policy applied to a depository institution holding company, rather than to a depository institution affiliate, are highly uncertain. If the holding company would voluntarily fund a greater proportion of its portfolio with subordinated debt than what was required by the subordinated debt policy, then it is most likely that the deposit insurance buffer would remain unchanged. If, however, a depository institution holding company were required to increase its reliance on subordinated debt funding, then the effect on the deposit insurance buffer would depend on what the holding company does with the funds. If the funds are downstreamed to a non-depository institution affiliate, then the policy would clearly have no impact on the deposit insurance loss buffer. If the funds are downstreamed to a depository institution and if such funds take the form of a funding source within the deposit insurance loss buffer (e.g., equity or subordinated debt), as is typically the case today, then the deposit insurance buffer would either remain the same or increase. Finally, if the funds were downstreamed to a depository institution as collateralized obligations or deposits, then a policy that is applied to depository institution holding companies might actually lead to a *reduction* in the deposit insurance buffer.

Notably, subordinated debt currently provides a substantial buffer to the federal deposit insurance funds. The amount of subordinated debt outstanding that is eligible for tier 2 regulatory capital is considerably larger than the fund balances of the Bank Insurance Fund (BIF) and the Savings Association Insurance Funds (SAIF), which together totaled about $40 billion in June 2000. For example, at the end of calendar year 1999, U.S. bank holding companies had on their books about $160 billion of subordinated debt that was eligible for inclusion in tier 2 capital.[47] About $140 billion of this total was on the books of the 50 largest bank holding companies. And the 20 largest holding companies in that year held about 80

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uninsured deposits.

[47]Only about half of this debt is held at the bank level. However, it is also common for bank holding companies to downstream subordinated debt as equity. Therefore, the contribution of bank holding company subordinated debt to the FDIC buffer may be close to $160 billion, although the exact amount is not known.

percent of the amount held by the top 50 organizations. Indeed, if only subordinated debt issuance by banks and bank holding companies in public markets over the last five years is considered, the funds raised would still be larger than the total amount of funds currently held by BIF and SAIF.

Reduced Regulatory Forbearance

Since the late 1980s, when subordinated debt proposals focused on reducing regulatory forbearance, there has been a significant shift in the depository institution regulatory regime. Specifically, the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) required the deposit insurer to engage in the "least cost" method of resolving a failed depository, and also mandated that all bank regulators implement prompt corrective action criteria. The "least cost" method would typically expose uninsured liabilities, including subordinated debt, to losses. Under prompt corrective action (PCA), critically undercapitalized banks, defined as those with a tangible equity ratio less than or equal to 2 percent, must be placed in receivership within 90 days, unless such action would not achieve the purposes of PCA, or within one year, unless specific statutory requirements are met.[48] In addition, after 60 days, no payments on subordinated debt can be made without regulatory approval.

Subsequent to FDICIA, subordinated debt investors have considered their funds more at risk. Both discussions with market participants and empirical research support this view.[49] Thus, in light of such regulatory reforms, some analysts believe that there is less need for mandatory subordinated debt to reduce regulatory forbearance in recent years.[50]

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[48]See D.J. Jones and K.K. King, 1995, "The Implementation of Prompt Corrective Action: An Assessment," *Journal of Banking and Finance,* 19, pp. 491-510.

[49]See discussion above that summarizes empirical research that has found issuance and secondary subordinated debt spreads to be risk sensitive.

[50]In addition, as discussed below, aspects of a mandatory subordinated debt policy designed to reduce regulatory forbearance, such as put options and rate caps, could be seriously pro-cyclical and destabilizing.

C. The Effects of Various Features of a Mandatory Subordinated Debt Policy on Operational Feasibility, Potential Benefits, and Potential Costs

A subordinated debt policy would consist of various rules and procedures that work together to achieve some or all of the specific policy objectives.[51] Even though this Report does not propose a mandatory policy at this time, this section analyzes the features in various proposals with respect as to how they might achieve the objectives of a subordinated debt policy. An examination of past subordinated debt proposals suggests that such design features can be grouped into five basic categories.[52]

First, a subordinated debt policy would need to specify the types of depository institutions or depository institution holding companies that would be subject to the subordinated debt requirement. For example, this study considers only those policies that would be applied to large insured depository institutions and large depository institution holding companies.

Second, a subordinated debt policy would need to specify the amount of subordinated debt that would be required. This amount is typically expressed as a percentage of assets, a percentage of deposits, or a percentage of risk-weighted on- and off-balance-sheet items.

Third, a subordinated debt policy could place restrictions on the debt that would qualify for meeting or exceeding the required amount. For example, specific debt characteristics could be required (e.g., a put option feature or a remaining life before maturity) or some debt characteristics could be forbidden (e.g., a step-up provision, a call option, or collateral). In addition, there could be a requirement that the debt instrument be publicly traded or be rated and held by third parties. Furthermore, a policy could place a restriction on the minimum issue size that would be allowed for qualifying subordinated debt.

Fourth, a subordinated debt policy could explicitly link market signals to insolvency procedures for troubled depository institutions. For example, a policy could "hard-wire" such

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[51]The policy objectives are (1) to improve direct market discipline, (2) to augment indirect market discipline, (3) to improve transparency and disclosure, (4) to increase the size of the financial cushion for the deposit insurer, and (5) to reduce regulatory forbearance.

[52]See appendix A for a summary of subordinated debt proposals.

procedures to either an exercise of put options by bondholders or to the secondary market spread rising above a specified level (e.g., a rate cap). Alternatively, the linkage could be less rule-based and could involve some discretion by the deposit insurer (e.g., a recapitalization plan could be required of institutions that did not meet certain capitalization criteria).

Fifth, a subordinated debt policy could indicate whether the issuance of subordinated debt is required on a regular basis. It could require, for example, the depository institution, or its holding company, to issue a qualifying subordinated debt instrument at least once per annum.

Not every subordinated debt policy contains features from each of the five categories described above. Indeed, early proposals typically only specified the types of institutions that would be subject to a mandatory subordinated debt policy and the amount that would be required.

This section of the Report presents pros and cons for many potential design features of a subordinated debt policy. In addition, it identifies the synergies between such design features that could improve operational feasibility, affect potential costs, and/or influence potential benefits. Potential costs include (1) the costs directly borne by the systemically important institutions that are subject to the policy (including costs associated with forced subordinated debt issuance, costs associated with a "second-best" capital structure, and costs associated with resultant competitive inequities) and (2) costs borne by society as a whole (including reductions in the liquidity provided to debt markets and reductions in financial stability). As demonstrated below, the likely magnitude of these potential costs and whether potential benefits would plausibly exceed such costs depend critically on the design of a subordinated debt policy. The discussion below focuses on whether the potential design features could be used, either separately or together, to achieve one or more of the policy objectives that have been identified.

Should the Policy Apply to the Depository Institution or Its Parent Holding Company?

Advocates for applying a subordinated debt policy to a depository institution, rather than to its parent holding company, generally focus on the following: exerting more direct and indirect market discipline on depository institutions -- the entities with direct access to the safety net -- to reduce moral hazard incentives; augmenting public disclosures; increasing the size of

the financial cushion for the deposit insurer; and mitigating the expected costs of such a policy during a period of stressful banking conditions.

Moral hazard incentives for insured depository institutions to take excessive risks arise from their direct access to the federal safety net. This is because some of the "downside risk" may be borne either by other depository institutions that pay into the deposit insurance fund or by taxpayers in the event that an insured depository institution becomes insolvent. An increase in direct and indirect market discipline would increase the cost of funding for, or restrict the supply of credit to, the riskiest depository institutions and would provide *ex ante* incentives for such institutions to reduce their risk. Hence, increased market discipline on insured depository institutions would directly mitigate the moral hazard incentives derived from direct access to the federal safety net.

A subordinated debt policy applied to depository institutions would reinforce the regulatory philosophy that the safety net and associated policies (e.g., prompt corrective action) are limited to insured depository institutions. This signal to the market is becoming increasingly important as holding companies become more widely diversified and as depository institutions less frequently dominate their affiliated holding companies. In principle, such a signal would encourage private analysts to take a closer look at the separate components of large depository institution holding companies, and may facilitate issuance of subordinated debt by depository institutions.

Forced issuance *by the insured depository institution* would provide market-based incentives for augmented public disclosures by such institutions. Investors with their own funds at risk would require information that would be pertinent to assessing the depository institution's prospects. Moreover, a requirement that issuance occur on a regular basis would amplify this effect, since market participants and research evidence indicate that increased disclosure occurs just prior to the issuance of subordinated debt. Indeed, such disclosures would, in principle, lead to secondary market prices that would be more informative and, therefore, more useful for indirect market discipline purposes.

If the subordinated debt policy were applied to the insured depository institution, then the size of the financial cushion for the deposit insurer could potentially be increased. However, as discussed above, this potential benefit of a mandatory policy is unlikely to be large.

The accounting conventions for the consolidation of the individual financial reports of affiliates within a holding company favor a requirement that applies to depository institutions. Subordinated debt issued by the depository institution to third parties would, when the holding company's books were consolidated, also be counted as subordinated debt at the holding company level by both the market and regulators. Such accounting conventions do not, however, work in the reverse order: Subordinated debt issued by a parent holding company need not be downstreamed to the depository institution as subordinated debt. For example, the subordinated debt issued by the parent holding company could be downstreamed to another type of entity (e.g., an insurance company) within the holding company. In such circumstances, the funds that were raised in the subordinated debt market may not be available to the deposit insurer in the event that the depository institution becomes insolvent. Funds raised through the issuance of subordinated notes and debentures could also be downstreamed from the parent to the depository institution as equity. Although such actions could potentially increase the financial cushion for the deposit insurer, such double-leveraging could also place undue pressure on a depository institution to pay dividends to the parent in the event that the parent becomes distressed and has difficulty making its own interest payments.

It can also be argued that a requirement that applies to depository institutions would likely be less costly during periods of individual firm or systemic stress than would a requirement that applies to depository institution holding companies. Discussions with market participants indicate that the debt rating of the long-term senior debt and the subordinated debt of a bank included among the largest 50 U.S. banks is typically one or two notches higher than the rating of comparable debt of its parent bank holding company. As shown in table 6 below, the value of a notch varies over time and ratings. During relatively tranquil economic times (e.g., 1992-96) the spread per notch is generally less than during more stressful economic times (e.g., 1990-91). And the spread per notch is considerably larger as a firm moves toward the lower investment grades. Thus, issuance at the depository institution level would be less costly than at

the parent holding company level in the event that an institution's condition or economic conditions deteriorate.

Proponents of applying a subordinated debt policy to the depository institution holding company typically argue that there would be significant benefits from increasing market discipline on depository institution holding companies and that the costs of achieving such benefits would be quite low given current market conventions. Such benefits would be particularly important as traditional distinctions between "banking" and "nonbanking" activities continue to blur, and as the large and complex financial organizations that engage in both come to have increased systemic importance.

Empirical evidence suggests that the current subordinated debt market exerts market discipline on large bank holding companies. Studies have demonstrated that primary and secondary spreads on holding company spreads are risk sensitive. This suggests that such spreads may be useful for indirect market discipline purposes for either private parties or for supervisors. Moreover, research suggests that there is information content in a holding company's decision to issue subordinated debt. To the extent that *ex ante* risks are reduced by the expectation of higher future funding costs in the subordinated debt market, there is a greater likelihood that the holding company can be a source of strength should an affiliated depository institution become troubled.

TABLE 6. INTEREST RATES AND SPREADS PER RATING NOTCH FOR INVESTMENT-GRADE BONDS

YEAR	Aaa RATE (PERCENT)	SPREAD PER NOTCH[53] (IN BASIS POINTS)		
		Aa OVER Aaa	A OVER Aa	Baa OVER A
1990	9.32	8	9	18
1991	8.77	9	8	17
1992	8.14	11	5	12
1993	7.22	6	6	12
1994	7.97	6	4	12
1995	7.59	4	4	12
1996	7.37	6	5	12
1997	7.27	7	2	11
1998	6.53	9	4	10
1999	7.05	10	5	12

Source: Moody's Investor Service.

Market signals that take into account the diversification of risks across legal entities, or that take into account synergies that are attained across legal entities, could potentially be useful to bank supervisors. For example, a financial holding company may consist of depository institutions and other firms that engage in activities that are financial in nature. While each separate entity may be individually regulated and supervised, there is little experience in assessing the combined risks of large organizations that provide both bank and traditionally non-bank activities. Market participants with their own funds at risk have an incentive to monitor the activities of the firms in which they invest and to demand disclosures pertinent to assessing their risk. Indeed, anecdotal evidence suggests that ratings and bond spreads reflect diversification benefits across different types of entities. Because such participants would be concerned with the performance of the organization as a whole, rather than the constituent parts, spreads on the

[53]A single notch is the finest gradation in Moody's rating system. Each letter rating below Aaa has three gradations, indicated by the qualifier of 1, 2, or 3 (with 1 being the highest quality).

holding company subordinated debt may embody information that is relevant to bank supervisors.

As with forced issuance by depository institutions, forced issuance by *depository institution holding companies* would provide market-based incentives for augmented public disclosures by such institutions. Analogously, investors with their own funds at risk would require information that would be pertinent to assessing the depository institution holding company's prospects. Moreover, a requirement that issuance occur on a regular basis would likely amplify this effect. Indeed, such disclosures would, in principle, lead to secondary market prices that would be more informative and, therefore, more useful for indirect market discipline purposes.

Funding managers at large banking organizations argue that the flexibility to allocate funds to the separate entities within the total organization is important. Funding costs can be lower for an entire organization than for the separate legal entities, particularly when funds are used to diversify across risks held by each separate entity. Moreover, if a holding company is managed on a "product" or "business" line basis, then relatively little attention would be paid to any one legal entity. In such circumstances, significant costs could be imposed on the depository institution holding company if it had to maintain one set of books for its internal management purposes and another for supervisory and external market purposes.

Discussions with market participants also indicated that name recognition is important in the subordinated debt market. The current market for publicly traded subordinated debt is overwhelmingly a market for debt that has been issued by holding companies. Thus, if a subordinated debt policy were to be applied to depository institutions, the market for depository institution debt would need to be substantially increased. Funding managers raised concerns that issuance costs would increase if subordinated debt were issued at both the depository institution and holding company levels of their organizations. While their holding company names have the recognition needed to distribute their debt to market participants, many funding managers felt that their depository institution affiliate names did not. Some funding managers even suggested that they have issued debt only at the holding company because that was where the name recognition was and that they perceived that some confusion in the market would arise if

they sometimes issued debt at the holding company level and at other times issued debt at the depository institution level.

In sum, proponents for applying a subordinated debt policy to holding companies, rather than to depository institutions, argue that (1) market discipline on holding companies is important, (2) spreads on subordinated debt for holding companies would be useful for bank supervisors and for other third-parties, and (3) given current market practices, it would be less costly to impose a mandatory subordinated debt requirement on depository institution holding companies than it would be to impose such a requirement on depository institutions.

An intermediate policy between requiring that subordinated debt be issued either at the depository or at its holding company would be to implement a "switching rule" that would require subordinated debt issuance at the depository level if depository institution assets fell below a given proportion (switching point) of total holding company assets. Such a policy would recognize the market reality that if banking activities dominate a holding company's operations, market participants tend to view the bank and its holding company in a very similar manner. To the extent that the holding company currently issues the subordinated debt, the policy also would not impose additional costs on a holding company that engaged primarily in banking activities. And a switching rule policy would signal market participants that it is important to distinguish between insured depositories and the non-insured subsidiaries of a holding company.

Implementation of a switching rule could, however, prove to be complex. For one thing, choice of a switching point would be essentially arbitrary, and the number of firms below the cut-off could be quite sensitive to the switching point chosen. For example, if the banking-to-total holding company assets threshold were 90 percent, the data in table 5 indicate that currently 8 of the largest 20 bank holding companies, and 6 of the top 10, would be required to issue subordinated debt at the bank level. If the switching point were raised to 95 percent, 13 of the 20 largest banking organizations, including 9 of the top 10, would have to issue subordinated debt at the bank level. In a multibank holding company, deciding which bank would issue subordinated debt could prove difficult if no single "lead" bank clearly dominated the other depository institutions in the holding company. Given the importance of off-balance-sheet activities to

many of the largest banking organizations, even the definition of assets to be used in the calculation could prove troublesome. Moreover, banking organizations could be encouraged to move assets between holding company subsidiaries, or to engage in other types of "regulatory arbitrage," solely to comply with the rule, increasing the costs of the policy.[54] This incentive would be especially strong in at least three cases: (1) at organizations close to the switching point; (2) for on-balance-sheet assets that could be turned into off-balance-sheet assets if the two types of assets were not treated consistently; and (3) if the policy did not apply only to the most senior "parent" holding company.

Should the Policy Require More Subordinated Debt than 2 Percent of Risk-weighted Assets?

With respect to the amount of subordinated debt to be required, existing subordinated debt proposals tend to fall into two groups. One group would require about 2 percent of risk-weighted assets be funded with subordinated debt.[55] The other group would require substantially more funding by subordinated debt, typically in the range of 4 percent to 6 percent of either assets or risk-weighted assets.

There is considerable disagreement about whether debt and equity are good substitutes for each other. Those who would require a larger proportion of assets to be funded with subordinated debt typically argue that debt and equity are good substitutes because both equity holders and subordinated debt holders have a lower priority claim than does the deposit insurer in the event that a depository institution becomes insolvent. Some proponents of this view also argue that a larger proportion of the portfolio funded with subordinated debt would likely increase the financial cushion for the deposit insurer, since subordinated debt holders would be

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[54] "Regulatory capital arbitrage" behavior by banking organizations is one of the primary motivations behind current efforts to revise international risk-based capital standards, known as the Basel Accord. See Bank of International Settlements, 1999, "Consultative Paper on a New Capital Adequacy Framework," Basel Committee on Banking Supervision, June 3.

[55] Half of the subordinated debt proposals summarized in appendix A would require about 2 percent of risk-weighted assets be funded with subordinated debt.

concerned with the potential solvency of the debt issuer and, therefore, would require equity holders to increase their funding of the firm's portfolio. If this is the case, then a larger minimum ratio of subordinated debt to total or risk-weighted assets would effectively increase the insurance deductible for deposit insurance and thereby shift some risk to the private sector.[56]

Those who would require a smaller proportion of assets to be funded with subordinated debt typically argue that equity has an advantage over debt because equity is a more flexible instrument for maintaining the viability of the firm. Importantly, dividends on common stock do not have to be paid, while nonpayment of interest on subordinated debt constitutes an event of default that creates a legal claim against a firm and may cause its failure. In addition, although it is unlikely that the interest expenditure on subordinated debt obligations would cause a depository institution to fail, such expenditures in many instances would deplete an institution's retained earnings and would limit its ability to build capital through retained earnings.[57] Interestingly, even the rating agencies appear to disagree on whether subordinated notes and debentures are good substitutes for equity. It almost goes without saying that the financial cushion for the deposit insurer would be unlikely to increase dramatically with a 2 percent subordinated debt requirement, since most systemically important depository institutions already fund at least this proportion of their portfolio with subordinated debt or other hybrid capital instruments such as trust preferred stock.

There is also considerable disagreement about whether a subordinated debt policy should focus on direct market discipline or on indirect market discipline. On the one hand, those who would require a larger proportion of assets to be funded with subordinated debt tend to focus on the direct discipline aspects of a subordinated debt policy. Foremost, it is argued that more

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[56]The buffer provided by subordinated debt affects the value of the deposit insurer's position by changing the probability that the put options written by the deposit insurer will be "in the money." See W.P. Osterberg and J.B. Thomson, 1991, "The Effect of Subordinated Debt and Surety Bonds on the Cost of Capital for Banks and the Value of Federal Deposit Insurance," *Journal of Banking and Finance,* 15, 939-53.

[57]For these reasons, as part of the policy of prompt corrective action, supervisors have the right to suspend payments on subordinated debt.

frequent issuance of larger-size issues would naturally arise when this proportion is large, rather than small. Because market participants tend to focus on disclosures during issuance, more frequent issuance could both increase disclosures and refresh secondary prices on each firm's outstanding subordinated debt. In addition, more frequent issuance would subject the firm to a debt market test on a more frequent basis. The expectation of substantially increased funding costs from greater risk-taking would enhance direct market discipline. Also, with more recent debt outstanding, it is more likely that such debt would be quite liquid. Actively traded issues with boosted information from the issuance process would, presumably, imply better market signals of the firm's condition. And, if this were the case, then increased indirect market discipline may follow.

On the other hand, those who would require a smaller proportion of assets to be funded with subordinated debt tend to focus on the indirect discipline aspects of a subordinated debt policy. It is observed that (1) most of the largest depository institution holding companies already fund about 2 percent of their risk-weighted assets with subordinated debt and (2) such organizations typically issue subordinated debt on a fairly frequent basis with an issue size that ensures a considerable degree of liquidity for the instrument in the bond market. Thus, even with a relatively small proportion of the portfolio funded with subordinated debt, the secondary prices on such debt can potentially be used by bank supervisors and by third parties to monitor the condition of the largest firms. Some advocates for a relatively modest subordinated debt requirement also argue that issuance of such debt could be required on a regular basis. Combining this feature of a subordinated debt policy with a 2 percent requirement could potentially but, admittedly modestly, increase direct discipline, because the firm would expect that it would pay higher funding costs with greater risks, and increase indirect market discipline, since there would be a recent issue outstanding at all times.

Regulatory capital guidelines have undoubtedly influenced subordinated debt issuance decisions by depository institutions and depository institution holding companies to date. One need only point to the instrument characteristics chosen by such institutions. For example, maturities at issuance are typically long enough to ensure eligibility for tier 2 capital for an extended period before the amortization rule of the Basel Accord kicks in at five years remaining

to maturity.[58] In addition, it is more likely for a depository institution to issue subordinated debt when it would qualify for tier 2 standing. This is understandable, since the total capital-to-risk-weighted assets ratio (along with other regulatory capital ratios) is used to determine when prompt corrective actions by bank supervisors are appropriate. With a subordinated debt requirement of only 2 percent, a depository institution's minimum amount of subordinated debt would remain eligible for tier 2 status until it became undercapitalized under prompt corrective action criteria.[59] As the proportion of assets funded with subordinated debt rises, the likelihood that the subordinated debt would remain eligible for tier 2 status in the event that the depository institution becomes troubled declines.

Partly because of the international harmonization of capital requirements, a policy that would require large banking organizations to have 2 percent of their risk-weighted assets funded by subordinated debt would not be likely to put the U.S. banking system at a substantial competitive disadvantage relative to foreign banks. The majority of large U.S. banking organizations with substantial foreign operations tend to have sufficient subordinated debt to satisfy a 2 percent requirement. For example, in the fourth quarter of 1999, among the eight large U.S. banking organizations with foreign operations that generated at least 10 percent of their total revenue, six had amounts of subordinated debt outstanding that exceeded 2 percent of their respective risk-weighted assets. Moreover, large European banks have on average about 2 percent of their total assets funded with subordinated debt, which implies that those banks would

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[58]As a limited-life capital instrument approaches maturity, it begins to take on the characteristics of a short-term obligation. For this reason, the outstanding amount of subordinated debt that is eligible for inclusion in tier 2 regulatory capital is reduced, or discounted, as these instruments approach maturity: One-fifth of the original amount (less redemptions) is excluded each year during the instrument's last five years before maturity. When the remaining maturity is less than one year, the instrument is excluded from tier 2 capital. See Board of Governors of the Federal Reserve System, 1999, *Capital Adequacy Guidelines*, Washington, D.C., May, p.37.

[59]The depository institution becomes undercapitalized when its tier 1 risk-based capital ratio falls below 4 percent. Eligible subordinated debt can not exceed 50 percent of tier 1 capital.

have on average more than 2 percent of their risk-weighted assets funded with subordinated debt.[60]

The parallel adoption of subordinated debt policies in the United States and other countries would likely impose less disruption on the international competitive landscape than would any unilateral policy. However, it is not clear whether the costs of a subordinated debt policy would be similar in different countries. On the one hand, one might expect that the cost -- in terms of debt yield -- of issuing subordinated debt borne by U.S. depository institutions and depository institution holding companies would be relatively low because the U.S. bond market is liquid relative to foreign bond markets.[61] On the other hand, one might expect that the cost of issuing the subordinated debt of U.S. depositories would be high relative to certain foreign banks that are owned or have all their liabilities (including subordinated debt) explicitly guaranteed by their country's government. Thus, it is difficult to predict whether on net U.S. institutions would be better or worse off than their European counterparts with the parallel adoption of a mandatory subordinated debt requirement. In addition, it appears that a requirement that banks issue subordinated debt frequently would be better borne by foreign (large) institutions, as European banks typically issue up to four or five times per year at this time.[62]

Both those who would impose a 2 percent subordinated debt requirement and those who would impose a larger subordinated debt requirement agree that subordinated debt holders have an incentive to pressure regulators to intervene promptly with capital deficient depository institutions. As noted above, the timing and method of closure chosen by the regulator can affect the losses incurred by subordinated debt holders in the event that a depository institution

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[60]See A. Sironi, 2000, "An Analysis of European Banks SND Issues and Its Implications for the Design of a Mandatory Subordinated Debt Policy," FEDS Working Paper, Board of Governors of the Federal Reserve System, Washington, D.C., July.

[61] It is well known that investors purchase debt at substantial premiums (i.e., a higher price and lower yield) when they anticipate that the secondary market for such debt will be liquid.

[62] See A. Sironi, 2000, "An Analysis of European Banks SND Issues and Its Implications for the Design of a Mandatory Subordinated Debt Policy."

exhausts its capital. That is, if an institution is closed at the exact time of economic insolvency, then stockholders incur losses, but subordinated debt holders do not. Therefore, the tendency for regulators to forbear may be tempered by the interests of the subordinated debt holders.[63]

Should the Policy Place Restrictions on the Debt that Would Qualify for Meeting or Exceeding the Required Amount?

Publicly Traded Debt? Some observers have argued that qualifying subordinated debt should be publicly traded or be rated and held by third parties. Supporters for the publicly traded restriction argue that traded debt would provide secondary market prices that could be used as frequent signals of a firm's condition. In practice, such signals are available only on issues that are quite large and on instruments that have been recently issued. Thus, this requirement by itself would be cost-effective only for very large depository institutions and depository institution holding companies. Such a requirement used in conjunction with forced regular issuance and a minimum issue size restriction could, perhaps, expand the number of firms for whom reliable secondary market signals would be available.

Other observers see little need to require publicly traded subordinated debt. It is argued that direct market discipline could be achieved through the issuance of subordinated debt to third parties. For example, suppose that a subordinated debt policy specified that only foreign banks could hold qualifying subordinated debt. Since foreign banks are unlikely to be bailed out by domestic authorities, foreign banks would require compensation commensurate with the risks undertaken by the domestic firm subject to the policy. Moreover, if issuance of subordinated debt to third parties is frequent and if issuance market prices are publicly available, then the signals of a depository institution's condition needed either by other private parties or by bank supervisors to impose indirect market discipline could come from the issuance market.

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[63]This tendency may be particularly important when foreign policy concerns are present. See L.D. Wall,1989, "A Plan for Reducing Future Deposit Insurance Losses: Puttable Subordinated Debt," *Economic Review*, Federal Reserve Bank of Atlanta, July/August, 2-17, and C. Calomiris,1997, *The Postmodern Bank Safety Net: Lessons from Developed and Developing Economies,* American Enterprise Institute for Public Policy Research: Washington, D.C.

Standardized Debt Instruments? Clearly, a standardized debt instrument with the same maturity, option characteristics, and covenants would make it easier for market participants to decipher the signals of a depository institution's condition. In fact, many market participants indicated that the recent emergence of relatively homogeneous subordinated debt instruments has made comparisons of prices in the depository institution and depository institution holding company subordinated debt market relatively straightforward and that such market-driven standardization was an important, if not the single most critical, reason for the depth and efficiency of the market.[64] This suggests that the standardization of debt instruments can facilitate comparisons of yields, the basis for direct and indirect market discipline.

All the same, a required standardized debt instrument would be more costly for some depository institutions to issue than for others because capital structures differ across depository institutions. Moreover, a standardized debt instrument may be costly during certain market conditions. For example, over the past decade, call options were once common and then virtually disappeared before becoming common once more.[65] Therefore, allowing depository institutions the flexibility to issue qualifying subordinated debt instruments with imbedded call options would likely reduce the costs of compliance associated with a subordinated debt policy.

Maturity Restrictions? An important element of the current homogeneity of subordinated debt instruments issued by depository institutions and depository institution holding companies is the predominance of initial ten-year maturity debt. To the extent that most firms have debt outstanding that is of similar initial maturity, this facilitates the interpretation and comparison of secondary market yields. For example, recently Treasury securities with relatively long maturities have not been supplied at what had become the usual pace. As a result, a scarcity premium became embedded in Treasury security rates at the longer end of the maturity spectrum. Under these circumstances, if an analyst adjusts subordinated debenture rates by comparable maturity Treasury rates across the maturity spectrum, then firms with debt of a

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[64]See Board of Governors of the Federal Reserve System, 1999, "Using Subordinated Debt as an Instrument of Market Discipline," Staff Study 172, Washington, D.C., p.16.

[65]See tables 2 and 3.

relatively long maturity would appear to have wider spreads while firms with debt of short maturity would appear to have narrower spreads even if, other things being equal, there is no difference in the riskiness of the individual firms. This example illustrates that a standardized maturity for subordinated debt issues could ease the interpretation and comparison of secondary market yields, which would in turn facilitate both the direct and indirect market discipline roles of subordinated debt.

The benefits of a standardized maturity for subordinated debt instruments would not be achieved without costs. Restrictions on allowable maturities would reduce the ability of funding managers to attract different types of investors by varying the maturities on an institution's subordinated debt instruments. Such restrictions would also increase the costs of compliance associated with a mandatory subordinated debt policy, particularly during periods of volatile interest rates.

Still, a long maturity tends to magnify the risk sensitivity of subordinated investors, since the probability of default over the life of the contract must be considered. Moreover, a long maturity means that the subordinated debt investors would not be able to "run" the bank, which could mitigate a systemic risk situation. Against these benefits must be weighed the cost of less frequent issuance. An optimal minimum maturity would be long enough to prevent runs and to ensure risk-sensitivity of the debt instrument, but short enough that the quality of the price signal was maintained through sufficiently frequent issuance.

Should the Policy Hard-wire Insolvency Procedures?

Subordinated debt holders have a strong incentive to pressure regulators to intervene promptly in a capital deficient depository institution. Currently, the "failure" and subsequent closure of a depository institution occurs not when the institution becomes *economically* insolvent (i.e., when the market value of assets falls below the value of liabilities), but when the institution is declared insolvent by regulators.[66] The timing of this closure decision affects the

[66]Under prompt corrective action (PCA), critically undercapitalized banks, defined as those with a tangible equity ratio less than or equal to 2 percent, must be placed in receivership within 90 days, unless such action would not achieve the purposes of PCA, or within one year, unless specific statutory requirements are met. After 60 days, no payments on subordinated debt

losses suffered by the subordinated debt holders. In addition, the deposit insurer's method of resolution based on the "least cost" test could affect not only the downside risks but also the upside potential for subordinated debt holders once insolvency has been determined by the regulators.

Puts? Some advocates of a subordinated debt policy would attach a put option to subordinated debt instruments and use the exercise of such options by debt holders to hard-wire insolvency procedures and/or supervisory actions.[67] It is argued that put options would strengthen market discipline by giving subordinated debt holders a strong say, perhaps even control, over the timing of the closure of a depository institution. In addition, the exercise of put options could automatically trigger supervisory actions that would potentially increase indirect market discipline.

Although the exercise of a put option by a significant number of subordinated debt holders would provide a clear signal that a depository institution was probably in serious trouble, it could also lead other uninsured creditors, such as other subordinated debt holders, uninsured depositors, and sellers of federal funds, to withdraw their funds. Such actions could increase liquidity pressure on the depository institution and bring about or hasten its insolvency. If a very large depository institution were to become insolvent or, more generally, if there were a period of financial crisis, some instability in the subordinated debt market could arise and other (safely managed) depository institutions could potentially be affected by the simultaneous exercise of puts in the subordinated debt market. Given the observed positive correlation of risks across many depository institutions, this simultaneous exercise of puts could exacerbate a situation with systemic risk implications much as a "run" would. Although the threat of a run exerts strong

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can be made without regulatory approval. See D. Jones and K.K. King, 1995, "The Implementation of Prompt Corrective Action: An Assessment," *Journal of Banking and Finance,* 19, pp. 491-510.

[67]Buying a put option gives the purchaser a right to sell a security at the exercise price. Put options are "in the money" when the price of a security falls below the exercise price. If, however, the price of the security rises, or stays above the exercise price, then the put will expire worthless.

market discipline on depository institutions, introducing such a threat as part of a subordinated debt policy seems problematic at best and is inconsistent with the "nonrunable" benefit of subordinated debt.

Rate Caps? Other advocates of a subordinated debt policy would attach a rate cap on qualifying subordinated debt. The basic idea of a rate cap is to force a depository institution that was unable to issue debt with a spread below a specified maximum spread (rate cap) to lower its riskiness by shrinking its assets or by changing its asset mix. Such a rule would focus on increasing the amount of direct discipline exerted by the subordinated debt market on risky depository institutions. Alternatively, a rate cap could be used to trigger supervisory actions in the same way that a depository institution's capital ratios currently trigger prompt corrective action. Such a hard-wired rule, based either on issuance spreads or secondary market spreads, would be aimed at enhancing indirect market discipline on depository institutions.

Implementation of a rate cap would face a number of difficult, perhaps even insurmountable, problems. For example, debt spreads are influenced by liquidity (of the instrument, of the bond market, and of the benchmark security used in their calculation), instrument characteristics (e.g., maturity, call option, step-ups), the expected probability of default, the degree of risk sensitivity in the bond market, and the amount of time that has elapsed since the firm last issued debt with the same level of subordination. Thus, even if debt instruments were standardized and issuances were required on a regular basis, it would be difficult, perhaps in practice impossible, to determine the optimal rate, or spread, that should serve as a rate cap, particularly since the optimal rate cap would vary with bond market and macroeconomic conditions.

A hard-wired fixed rate cap might harshly punish all depository institutions subject to the subordinated debt policy unnecessarily when the bond market is highly illiquid. To the extent that a rate cap would become binding during an illiquid bond market even for the "safest" depository institutions, a rate cap could exacerbate a liquidity squeeze on the corporate sector, with potential macroeconomic consequences.

Lastly, a hard-wired fixed rate cap might be highly pro-cyclical. During economic downturns, the spreads on subordinated debt for depository institutions tend to widen. Thus,

more depository institutions would be likely to violate a fixed rate cap limit during such times and would be forced to shrink, change their asset mix, or face supervisory discipline. While some pro-cyclical effects of a subordinated debt policy are unavoidable, a fixed rate cap may make such a policy so severely pro-cyclical as to be undesirable from a macroeconomic perspective.

Should the Policy Require Regular Issuance?

As discussed above, a requirement that subordinated debt issuance occur on a regular basis could potentially improve both direct and indirect market discipline. Because some relatively risky depository institution holding companies choose not to issue during stressful banking conditions, forced issuance during such periods could substantially increase the funding costs that would be associated with risk-taking over and above those costs associated with not issuing subordinated debt. Higher expected funding costs would, in principle, provide an *ex ante* incentive for such firms to reduce their risks. Moreover, disclosures, and the attention paid to such disclosures around the time that a firm issues new debt, would likely refresh secondary market subordinated debt prices. To the extent that such prices thereby more fully reflect the market's assessment of the underlying risks of the depository institution or depository institution holding company, the better such prices are for indirect market discipline purposes. And frequent renewal of the information content of secondary prices may be highly beneficial as financial and technological innovations allow depository institutions to rapidly alter their financial condition. Indeed, as noted above, forced issuance can allow issuance spreads to substitute for secondary market spreads for indirect market discipline purposes.[68]

If at times there is a "flight to quality" by bond investors, so that the market risk sensitivity of debt spreads rises, then relatively risky depositories may prefer not to issue subordinated debt until this risk sensitivity declines. This suggests that a regular issuance requirement would constitute a competitive disadvantage for the internationally active banking organizations that are viewed as relatively risky during such times.

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[68]For example, Sironi (2000) argues that European banks may be subject to some indirect market discipline from frequent issuance of subordinated debt.

In addition, flexibility with respect to issuance timing may allow depository institutions to avoid the unnecessary cost of issuing subordinated debt during periods in which the bond market is illiquid. Forced bond issuance during periods where bond market liquidity has all but dried up could substantially increase the funding costs of even the safest and best-managed banks. Such costs would not necessarily induce depositories to mitigate their *ex ante* risks and could potentially have destabilizing effects on U.S. depository institutions. One potential way to reduce such effects is for a policy to allow circumstances for supervisory waivers from forced issuance during such periods. A low required frequency of issuance might also mitigate such problems and continue to allow depository institutions to signal their financial condition through their timing of issuance.

Flexibility with respect to issuance timing may also be beneficial for other reasons. For example, a requirement of relatively frequent issuance may result in smaller issue sizes, or shorter issue maturities, that may be less liquid or more likely to "run."

III. CONCLUSION

The evidence presented and evaluated in this Report suggests that a mandatory subordinated debt policy applied to the largest U.S. banking organizations would be likely to help achieve to some degree the primary objectives of such a policy. These objectives include (1) improving direct market discipline, (2) augmenting indirect market discipline exerted by government supervisors and private secondary market participants, (3) encouraging transparency and disclosure by banking organizations, (4) increasing the size of the financial cushion for the deposit insurer, and (5) possibly reducing regulatory forbearance. However, the uncertainties regarding these benefits are considerable, implementation of even the most straightforward mandatory policy (e.g., only a required amount outstanding) would impose some costs on banking organizations, and more complex policies (e.g., those with issuance at regular intervals, restrictions on instrument characteristics, rate caps) could impose quite substantial costs. On balance, the net benefits of even the most straightforward policy are less clear than what is necessary to justify a mandatory policy.

Despite these uncertainties and reservations, the evidence supporting a fairly straightforward mandatory subordinated debt policy with modest objectives is sufficiently strong that continued research and evaluation seem warranted. In addition, future policy and other developments may help to clarify both the need and the potential for achieving substantial benefits from a subordinated debt policy. At a minimum, the evidence supporting the existing risk sensitivity of the debt issuance decision, issuance spreads, and secondary market spreads clearly motivates the continued monitoring and evaluation of such spreads by bank supervisors. Moreover, this evidence also supports continued efforts by bank supervisors and market participants to improve their ability to interpret changes in depository institutions and depository institution holding company decisions to issue subordinated debt and movements in issuance and secondary market spreads.

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APPENDIX A. A SUMMARY OF VARIOUS SUBORDINATED DEBT PROPOSALS

BIBLIOGRAPHIC CITATION	REQUIRED CUSHION	DEBT CHARACTERISTICS					INSOLVENCY PROCEDURES	BANKS SUBJECT TO PROPOSAL
		MATURITY	ISSUANCE	COVENANTS	RATE CAP	PUTABLE DEBT		
Federal Deposit Insurance Corporation, 1983. "Deposit Insurance in a Changing Environment: A Study of the Current System of Deposit Insurance Pursuant to Section 712 of the Garn-St Germain Depository Institutions Act of 1982," A Report to Congress on Deposit Insurance. U.S. Government Printing Office: Washington, D.C., June.	Banks would be required to maintain a minimum protective cushion to support deposits (say, 10 percent), which would be met by use of a combination of equity and subordinated debt.	Maturity selection should take into consideration the desirability of frequent exposure to market judgement. The total debt perhaps should mature serially (say, one-third every two years).	As banks grow they would be required to proportionately add to their "capitalization." Those heavily dependent on debt, primarily the larger banks, would have to go to the market frequently to expand their cushion and to refinance maturing issues.	Penalties would be imposed on banks that fell below minimum levels. Provisions that debt holders receive some equity interest and exercise some management control, such as in the selection of members of the board of directors, may be appropriate, as may convertibility to common stock under certain provisions.	None.	Not discussed.	FDIC assistance might still be granted and serious disruption avoided in a manner that would not benefit stockholders and subordinate creditors. This could be accomplished by effecting a phantom merger transaction with a newly chartered bank that has been capitalized with FDIC financial assistance. The new bank would assume the liabilities of the closed bank and purchase its high-quality assets.	Not discussed.
Benston, G., R.A. Eisenbeis, P.M. Horvitz, E. Kane, and G. C. Kaufman, 1986, *Perspectives on Safe and Sound Banking*, MIT Press: Cambridge, Mass.	A significant level (say, 3 to 5 percent of deposits or a certain proportion of equity).	Short maturity, but long enough to prevent runs.	Frequent.	Yes, to restrict the ability of the banks to engage in risky activities.	None.	Small percentage of the issue should be redeemed at the option of the holder.	Prompt closure when market value of equity is zero. To protect the FDIC, the notes would have to allow for wide discretion by the FDIC in arranging purchases and assumptions in cases of insolvency.	Large banks would be able to sell subordinated debt notes through the national financial markets, small banks might be able to sell capital notes over the counter to customers locally (or locally by other means), but medium-size banks would be too large to sell sufficient notes locally but not large enough to have access to national markets.

APPENDIX A. A SUMMARY OF VARIOUS SUBORDINATED DEBT PROPOSALS *(Continued)*

BIBLIOGRAPHIC CITATION	REQUIRED CUSHION	DEBT CHARACTERISTICS					INSOLVENCY PROCEDURES	BANKS SUBJECT TO PROPOSAL
		MATURITY	ISSUANCE	COVENANTS	RATE CAP	PUTABLE DEBT		
Horvitz, P.M., 1986, "Subordinated Debt Is Key to New Bank Capital Requirement," *American Banker*, December 31.	4 percent of deposits.	Not discussed.	Not discussed.	Not discussed.	None.	Not discussed.	FDIC would choose when to close the bank. Subordinated debt holders would provide a margin of error in the determination of when a bank should be closed and would reduce the loss to the FDIC.	Not discussed.
Litan, R.E., and J. Rauch, 1997, *American Finance for the 21st Century*, U.S. Government Printing Office: U.S. Treasury, November 17.	A minimum of 1 to 2 percent of risk-weighted assets.	The subordinated bonds would have maturities of at least one year.	A fraction of the subordinated debt outstanding would come due in each quarter.	Not discussed.	Not discussed.	Not discussed.	Not discussed.	Subordinated debt would be required only of banks in organizations above a certain size (say, $10 billion in total assets).
The Bankers Roundtable, 1998, *Market-Based Incentive Regulation and Supervision: A Paradigm for the Future*, Washington, D.C., April.	A minimum of 2 percent of liabilities.	Not discussed.	Not discussed.	Not discussed.	Not discussed.	Not discussed.	Not discussed.	Banks would have the option of complying with either a Basel-type risk-based capital standard or on approaches that rely on more market-based elements. Those banks that (a) are "adequately capitalized" but not subject to the leverage requirements under prompt corrective action, or (b) determine appropriate capital levels using internal management procedures would be *required* to issue subordinated debt.

APPENDIX A. A SUMMARY OF VARIOUS SUBORDINATED DEBT PROPOSALS *(Continued)*

BIBLIOGRAPHIC CITATION	REQUIRED CUSHION	DEBT CHARACTERISTICS					INSOLVENCY PROCEDURES	BANKS SUBJECT TO PROPOSAL
		MATURITY	ISSUANCE	COVENANTS	RATE CAP	PUTABLE DEBT		
Keehn, S., 1988. "Banking on the Balance Powers and the Safety Net: A Proposal," mimeo, Federal Reserve Bank of Chicago.	Ratio of a minimum of 4 percent subordinated debt to risk assets along with a 4 percent equity requirement.	The subordinated bonds would have maturities of no less than five years.	Issues would be staggered to ensure that no more than 20 percent, and no less than 10 percent, mature within any one year.	Sanctions on bank dividend policy, payment of management fees, deposit growth, and deposit rates to be progressively increased as the bank's performance deteriorated.	None.	Not discussed.	Bank ownership would be converted to the subordinated debt holders following a judicial or regulatory determination of insolvency. Creditors would be converted to common shareholders and would have a prescribed period to recapitalize the bank or find an acquirer; failing that, the bank would be liquidated.	Small banks could be allowed alternative means to meet the debt requirement.
Cooper, K., and D.R. Fraser, 1988. "The Rising Cost of Bank Failures: A Proposed Solution." *Journal of Retail Banking*, vol. 10, Fall, pp. 5-12.	A specified percentage of deposits (e.g., 3 percent.)	The subordinate putable notes would not be long-term but would be rolled over at frequent intervals. These notes would be variable rate instruments with rate adjustments and interest payments made frequently.	Frequent.	Convertible to equity.	Yes, bonds would be putable at 95 percent of par value.	The notes would carry a "put" feature. They could be redeemed at the option of the note holders at a fixed percent of par value (say, 95 percent). The subordinated put notes would be redeemable not by the issuing bank but at the FDIC.	When a put occurred, the FDIC would be compensated for its payments on behalf of the issuing bank with nonvoting equity shares of the bank. The bank would have a prescribed period in which it could repurchase these equity shares. If it did not do so by the end of the period, revocation of the bank's charter would occur, and the FDIC would deal with the insolvent bank.	The put feature of the proposed subordinated debt would create a viable market for the instrument, no matter how small the issuing bank. If not, these banks could receive assistance from the FDIC or Federal Reserve in the placement of this debt with investors.

APPENDIX A. A SUMMARY OF VARIOUS SUBORDINATED DEBT PROPOSALS *(Continued)*

BIBLIOGRAPHIC CITATION	REQUIRED CUSHION	DEBT CHARACTERISTICS					INSOLVENCY PROCEDURES	BANKS SUBJECT TO PROPOSAL
		MATURITY	ISSUANCE	COVENANTS	RATE CAP	PUTABLE DEBT		
Wall, L. D., 1989, "A Plan for Reducing Future Deposit Insurance Losses: Putable Subordinated Debt," *Economic Review*, Federal Reserve Bank of Atlanta, July/ August, pp. 2-17.	Par value of putable subordinated debt greater than 4 to 5 percent of risk-weighted assets.	Bondholders would be allowed to request redemption in cases where such redemption did not violate regulatory standards.	At the bank level not the holding level.	Restrictions on the percentage of putable debt that could be owned by insiders individually and all together.	Not discussed.	Yes. Bondholders would be allowed to request redemption in cases where such redemption did not violate regulatory standards. With the exercise of a put, a bank would have 90 days to meet the requirements by issuing new debt or through reducing its subordinated debt requirements--say, through the sale of assets.	Any bank that could not honor the redemption requests on its putable subordinated debt at the end of 90 days without violating the regulatory requirements would be deemed insolvent and would be closed. If the proceeds of the sale or liquidation exceeded the total of deposits, that excess would first be returned to the subordinated debt holders; the remainder, if any, would be paid to equity holders.	Small banks, defined as those with less than $2 billion in assets, would be exempted because of the limited market they might face for subordinated debt instruments. Those banks would have the option of operating under the putable subordinated debt standard.
Evanoff, D.D., 1993, "Preferred Sources of Market Discipline," *Yale Journal on Regulation*, vol. 10, pp. 347-67.	A significant proportion of total capital would be held in subordinated debt. The 8 percent minimum capital requirement could be restructured to require a minimum of 4 percent equity and 4 percent subordinated debt.	Short enough so that the bank would have to go to the market on a regular basis, but long enough to tie debt holders to the bank and make the inability to run meaningful (e.g., five years).	Staggered so that banks would have to approach the market on a frequent basis (e.g., semi-annually).	Following the prompt corrective action (PCA) provisions of FDICIA, sanctions on bank dividend policy, payment of management fees, deposit growth, and deposit rates to be progressively increased as the bank's performance deteriorated. Implicit in the discussion seems to be the incorporation of the SND requirements into PCA.	None.	A variant of the proposal would require the bank to issue putable subordinated debt. The bank would have 90 days to issue replacement debt. If it could not do so, it would be taken over by the regulators.	Once a bank's debt capital fell below the required level, existing subordinated debt holders would be given an equity position and would have a prescribed period to recapitalize the bank or find an acquirer; failing that, the bank would be liquidated.	Suggests that a few investment bankers had indicated some interest in establishing mutual funds for the subordinated debt instruments issued by small banks. Also, author's conversations with small bankers suggested that they could raise this type of debt relatively easily.

APPENDIX A. A SUMMARY OF VARIOUS SUBORDINATED DEBT PROPOSALS *(Continued)*

BIBLIOGRAPHIC CITATION	REQUIRED CUSHION	DEBT CHARACTERISTICS					INSOLVENCY PROCEDURES	BANKS SUBJECT TO PROPOSAL
		MATURITY	ISSUANCE	COVENANTS	RATE CAP	PUTABLE DEBT		
Calomiris, C.W., 1997, *The Postmodern Bank Safety Net: Lessons from Developed and Developing Countries*, American Enterprise Institute: Washington, D.C.	2 percent of total nonreserve assets or 2 percent of risk-weighted assets	Not discussed.	To rollover debt, and to accommodate growth in the bank's balance sheet.	"Insiders" would not be permitted to hold subordinated debt. Further, holders of subordinated debt would have no direct or indirect interest in the stock of the bank that issues the debt. Author suggested that the ideal subordinated debt holders would be unrelated foreign financial institutions.	The subordinated debt would earn a yield no greater than 50 basis points above the riskless rate.	Not discussed.	Subordinated debt holders must have their money at stake when a bank becomes insolvent.	Yes.
Calomiris, C.W., "Building an Incentive-Compatible Safety Net," *Journal of Banking and Finance*, forthcoming. NOTE: This plan is labeled, "A subordinated debt plan for a developing country." We understand from discussions with the author that although a plan targeted at the U.S. would differ in some important details (especially in terms of acceptable investors), such a plan would generally work along the lines of the developing country proposal.	Banks must "maintain" a minimum fraction (say 2 percent) of their risky (non-Treasury bill) assets in subordinated debt (sometimes called uninsured deposits).	Two years.	1/24 of the issue would mature each month.	Debt must be issued to large domestic banks or foreign financial institutions. (See the "Banks subject to proposal" column for details.)	Rates would be capped at the one-year Treasury bill rate plus a "maximum spread" (say, 3 percent.)	Not discussed.	Banks that could not issue would be required to shrink their assets by 1/24 (4.17 percent) during the next month. If additional contraction is required (because of prior growth), then the additional shrinkage can be achieved over three months. (The author also discusses measuring assets and subordinated debt using a three-month moving average.) Presumably, this would result in the bank's liquidating all of its assets over 24 to 27 months if it could no longer issue SND.	The plan would apply to all banks. Debt issued by small banks (those that might have difficulty accessing foreign banks and international finance markets) could be held by large domestic or foreign banks. Debt issued by large banks must be held by foreign financial institutions.

APPENDIX A. A SUMMARY OF VARIOUS SUBORDINATED DEBT PROPOSALS *(Continued)*

BIBLIOGRAPHIC CITATION	REQUIRED CUSHION	DEBT CHARACTERISTICS					INSOLVENCY PROCEDURES	BANKS SUBJECT TO PROPOSAL
		MATURITY	ISSUANCE	COVENANTS	RATE CAP	PUTABLE DEBT		
Lang, W.W., and D. Robertson, 2000, "Analysis of Proposals for a Minimum Subordinated Debt Requirement," Working Paper, Office of the Comptroller of the Currency, March.	Banks must maintain 2 percent of their assets in subordinated debt. This percentage has appeal since it roughly conforms to current market practice.	Subordinated debt should have a relatively long maturity because: 1) long-term debt would provide information over a horizon that is complementary to the information provided by short-term uninsured bank liabilities; 2) long-term debt cannot cause a bank to collapse because of an irrational short-term run; and 3) instruments with longer maturities would tend to reduce the transaction costs of the bank's debt rollovers.	While rollovers undeniably bring increased disclosure, the authors do not see this disclosure as a strong argument for requiring frequent rollovers.	Subordinated debt should be held by independent third parties.	As triggers of regulatory action, yields on subordinated debt could complement the accounting-based triggers in prompt corrective action. Authors do not specify yields at which various regulatory actions would be taken. Further, it is argued that in some cases bank supervisors should be able to override a trigger after they issue a finding that the bank's risk and capital condition do not warrant imposing the required sanctions.	Not discussed.	The subordinated debt contract might require subordinated debt to lose value in the event of an assisted bank resolution.	The significant fixed costs associated with issuing publicly traded securities suggest the need to exempt small banks from any requirement to issue publicly held subordinated debt securities.

APPENDIX A. A SUMMARY OF VARIOUS SUBORDINATED DEBT PROPOSALS *(Continued)*

BIBLIOGRAPHIC CITATION	REQUIRED CUSHION	DEBT CHARACTERISTICS					INSOLVENCY PROCEDURES	BANKS SUBJECT TO PROPOSAL
		MATURITY	ISSUANCE	COVENANTS	RATE CAP	PUTABLE DEBT		
U.S. Shadow Regulatory Committee, 2000, "Reforming Bank Capital Regulation: A Proposal by the U.S. Shadow Regulatory Committee," The AEI Press, March.	Large insured banks would be required to back at least 2 percent of their outstanding assets and off-balance-sheet commitments with qualifying subordinated debt. Qualifying subordinated debt would be included on par with equity in the calculation of the bank's leverage ratio used for regulatory capital purposes.	Qualifying subordinated debt would be of a minimum remaining maturity (say, one year).	If a bank's qualifying subordinated debt is traded in public secondary markets with adequate minimum and average weekly volumes (measured in dollars of bonds traded) and the yields are directly observable, then secondary prices will be deemed adequate as a measure of the market's opinion of the bank's risk. Otherwise, the bank should be required to come to the primary market regularly (say, such that 10 percent of its qualifying debt requirement would have to mature in each quarter.)	Qualifying subordinated debt would be held at arm's length, and could not be repaid by the government or the FDIC as part of a "least cost resolution" or a "too-big-to-fail" intervention. In addition, regulators should have the power to mandate to withhold interest and principal payments in accordance with the rules stipulated under early intervention and resolution.	Regulators would link market prices of subordinated debt to the structured intervention rules under FDICIA. In addition, the following rule would be implemented. Whenever, for three consecutive months, the yield on the qualifying subordinated debt of a bank rises above the yield of moderately risky corporate bonds (say, those rated BBB or Baa) with similar maturity, the bank is considered to be in violation of its subordinated debt requirement. It would then be treated as though it were an undercapitalized bank.	Not discussed.	To ensure that subordinated debt is really junior to deposits, it should not be collateralized, there should be a prohibition on its repayment in the event other uninsured debts are protected by the FDIC.	Initially, it is proposed that the requirement apply to banks with assets greater than $10 billion. Over time, as transactions costs associated with issuing debt come down and the subordinated debt market deepens, regulators can and should consider lowering the size threshold for the requirement -- or, at the very least, not adjusting it for inflation (which would lower the threshold in real terms).

APPENDIX A. A SUMMARY OF VARIOUS SUBORDINATED DEBT PROPOSALS *(Continued)*								
BIBLIOGRAPHIC CITATION	REQUIRED CUSHION	DEBT CHARACTERISTICS					INSOLVENCY PROCEDURES	BANKS SUBJECT TO PROPOSAL
		MATURITY	ISSUANCE	COVENANTS	RATE CAP	PUTABLE DEBT		
Evanoff, D.D., and L.D. Wall, 2000, "Subordinated Debt as Bank Capital: A Proposal for Regulatory Reform," *Economic Perspectives*, Federal Reserve Bank of Chicago, Second Quarter.	Stage 2: The 25 largest banks would be required to issue a minimum of 2 percent of risk-weighted assets in subordinated debt. Stage 3: The 25 largest banks would be required to issue a minimum of 3 percent of risk-weighted assets in subordinated debt. The requirement would be extended to additional banks unless the regulators' analysis of subordinated debt markets finds evidence that the costs of issuance by additional banks would be prohibitive.	Stage 2: The subordinated debt must be 10-year, non-callable fixed-rate debt. Stage 3: The subordinated debt must be 5-year, non-callable fixed-rate debt. In this stage, the Basel Accord would be altered to eliminate the 50 percent of tier 1 capital limit and amortization feature associated with qualifying subordinated debt.	Stage 1: If deemed necessary, the regulatory agencies would obtain the necessary authority (via congressional action or regulatory mandate) to require banks and bank holding companies to issue a minimum amount of subordinated debt with prescribed characteristics and to use the debt levels and prices in implementing prompt corrective action. Stage 2: Subordinated debt would be issued on an annual basis with qualifying issues at least three months apart to avoid long periods between issues, or "bunching" of issues, during particularly tranquil times. Stage 3: There must be a minimum of two issues per year and the two qualifying issues must be at least two months apart.	Stages 2 and 3: Qualifying subordinated debt would have to be issued to independent third parties and be tradable in the secondary market. The debt's lead underwriter and market makers could not be institutions affiliated with the issuing bank, nor could the debt be held by affiliates. Additionally, no form of credit enhancements could be used to support the debt. The terms of the debt would explicitly state that the holder would not have access to a "rescue" under the too-big-to-fail systemic risk clause.	Stage 2: *De facto* rate cap. If a bank's outstanding subordinated debt trades at yields comparable to those of firms with a below investment grade rating (Ba or lower -- that is, junk bonds) for a period of two weeks or longer, then the bank would be presumed to be severely undercapitalized. Stage 3: Remaining capital triggers or trip wires associated with prompt corrective action could be augmented with subordinated debt rate-based triggers. The form of the trigger mechanism (for example, rate spreads over risk-free bonds or relative to certain ratings classes) and the exact rates/spreads that should serve as triggers would depend on further analysis conducted by regulators and others.	Not discussed.	Stage 1: Legislation would be proposed that explicitly prohibits the FDIC from absorbing losses for subordinated debt holders, thus excluding subordinated debt from the systemic risk exception in FDICIA. Stages 2 and 3: Failure to comply with the issuance requirement would trigger a presumption that the bank is critically undercapitalized. See also "Rate cap" discussion.	Stage 2: The 25 largest banks. Stage 3: The 25 largest banks and additional banks for whom issuance costs would not be excessive.

APPENDIX B. EVIDENCE FROM THE ARGENTINA SUBORDINATED DEBT EXPERIMENT

In the wake of the 1994-95 financial market turmoil set off by the devaluation of the Mexican peso, the Argentine Central Bank instituted regulatory reforms aimed at enhancing the safety and soundness of its banking industry. One such reform, intended to increase the market discipline of Argentine banks, is a subordinated debt requirement. Legislated in 1996 (but not put into effect before 1998), the original regulation dictates that every bank in Argentina must issue "subordinated debt" (at least subordinated to deposits) each year in the amount of 2 percent of its deposit base with a minimum maturity of two years, and as such it provides the only case-study of an actual subordinated debt policy.[69] This appendix briefly describes the study group's understanding of how the policy is currently implemented, considers how it might increase the market discipline of Argentine banks, and then summarizes a recent empirical study of the Argentine experience (Calomiris and Powell, 2000).[70]

To ease the potential burden that the subordinated debt requirement might place on banks, particularly small banks, the policy allows substantial flexibility in terms of how banks might comply with the subordinated debt policy. In particular, the regulations permit banks to satisfy the requirement with private loans from other highly rated institutions, such as foreign banks with a minimum credit rating, or domestic banks that have themselves satisfied the subordinated debt

[69]With this issuance requirement, the amount of subordinated debt that would be outstanding as a percentage of deposits would depend on whether the bank rolls over the existing debt at the end of each year as well as on the maturity of each debt instrument at issuance.

[70]The appendix relies heavily on the historical facts and empirical analysis in Calomiris and Powell, 2000, "Can Emerging Market Bank Regulators Establish Credible Discipline? The Case of Argentina, 1992-1999," World Bank Working Paper. Additional information on Argentine bank regulatory policy was obtained from the Argentine Central Bank's web site, and from Board of Governors of the Federal Reserve System, 1999, "Using Subordinated Debt as an Instrument for Market Discipline," Staff Study 172, Washington, D.C. (appendix F).

requirement.[71] Moreover, the policy was recently amended to allow banks to substitute higher capital and liquidity (reserve) requirements for the yearly subordinated debt issuance requirement. Foreign-owned banks with investment grade credit ratings are exempt from the subordinated debt requirement.

Other regulatory changes occurred in concert with the Argentine subordinated debt issuance policy, such as a stronger disclosure requirement, more intensive and credible procedures for supervising and auditing banks, and required credit ratings. Arguably, the most critical of these other policies from the perspective of market discipline is the increase in disclosure requirements, since the ability of a market to discipline a bank clearly depends on the ability of the market to evaluate the bank. The Argentine Central Bank (ACB) now publishes on its web site summaries of each bank's balance sheet. The summaries include regulatory ratios, financial ratios, and summary statistics on nonperforming loans and provisions. The new regulations also require banks to provide the ACB with information on all loans over $50. The information is then compiled by the ACB's credit bureau into a database that is publicly accessible through the Central Bank's web site. The data set is currently available and contains borrower names, bank names, exposure amounts, borrower ratings, and credit enhancements (e.g., guarantees).

The Argentine subordinated debt policy potentially provides banks with an incentive to mitigate risk-taking through two mechanisms: (1) risk premiums on their subordinated debt create a cost to risk-taking, and (2) higher capital and liquidity requirements in lieu of subordinated debt issuance force equity holders to face greater loss if the bank fails. In the language of this Report, the first mechanism "directly" disciplines the banks, and the second works "indirectly" through the supervisory and regulatory process.

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[71]The motivation behind the restrictions on the credit quality of the holders of subordinated debt is not clear. One possibility is that they are intended to funnel the subordinated debt issuance towards relatively sophisticated investors, although credit quality and compliance with the subordinated debt policy are not clear proxies for sophistication.

There is little potential for any other indirect mechanism stemming from the subordinated debt requirement.[72] For example, no institution could use secondary prices of subordinated debt to monitor and discipline banks, since these prices are not likely to be informative -- the secondary corporate bond market in Argentina is thought to be extremely thin, and bank subordinated debt generally does not appear to be traded. It is also impossible for the private sector to monitor and discipline banks based on how they choose to comply with the policy (either issue subordinated debt or raise capital and reserves), since the Argentine Central Bank does not disclose such information.[73] Furthermore, debt issuance prices are not necessarily informative about a bank's condition, particularly private debt issuance prices, since payment for such debt may take many forms (e.g., fees or quid pro quos).

Although the subordinated debt policy has been enforced in Argentina only for a few years, empirical evidence (found in Calomiris and Powell, 2000) from data through 1999 suggests that the policy had the potential to enhance direct and indirect market discipline.[74] The key piece of evidence in their study is that relatively safe banks appeared to be more likely to comply with the policy by issuing subordinated debt compared to relatively unsafe banks.[75] The apparent risk sensitivity of

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[72]The disclosure requirements are likely to generate their own indirect market discipline by providing bank counterparties with information about bank portfolios. For example, the ACB's web site may be used by depositors to determine whether their bank's portfolio contains loans to industries or firms in financial difficulty. If such exposures were found, the depositors could then discipline their bank by withdrawing funds from the bank. The focus here is on the market discipline attributable to the subordinated debt policy, but it is recognized that disclosure enhances the effectiveness of a subordinated debt policy and may also generate market discipline independently of such a policy.

[73]Calomiris and Powell contend that supervisors were concerned about creating false impressions about the health of those banks that may have had difficulty complying with the requirement during financial market turmoil. They also point out that the supervisors' lack of confidence in the market is at odds with the motivation for a subordinated debt requirement.

[74]Their paper also examines whether deposit markets discipline Argentinian banks. Indeed, this is the focus of their empirical investigation.

[75]Unsafe and safe bank groups were defined based on deposit growth, deposit and loan interest rates, nonperforming loans, and other measures of asset risk.

subordinated debt issuance suggests that investors in bank debt charged risk premiums that were high enough to induce some risky banks to refrain from issuing subordinated debt.[76] While there is not sufficient information to establish with certainty whether banks that anticipated compliance with the policy had an *ex ante* incentive to lower risk, the observation that relatively risky banks appeared to be deterred from issuing is consistent with such an *ex ante* incentive.

[76]Covitz, Hancock, and Kwast (2000) similarly infer the extent of market discipline in the U.S. from the decision of banking organizations to issue subordinated debt.

APPENDIX C. SUMMARY OF EMPIRICAL STUDIES ON THE EFFECTIVENESS OF MARKET DISCIPLINE EXERTED BY UNINSURED LIABILITIES ON BANKING ORGANIZATIONS

BIBLIOGRAPHIC CITATION	SAMPLE CHARACTERISTICS		UNINSURED LIABILITY	FINDINGS	EVIDENCE OF MARKET DISCIPLINE?
	PERIOD	BANKS, BHCS, OR BOTH?			
Avery, R.B., T.M. Belton, and M.A. Goldberg, 1988, "Market Discipline in Regulating Bank Risk: New Evidence from the Capital Markets," *Journal of Money, Credit and Banking*, November, pp. 547-610.	1983-84	71 BHCs 137 bonds	Subordinated debt	Risk premiums on bank-related long-term debt are virtually unrelated to traditional accounting measures of bank performance and the index proposed by the FDIC for assessing risk-related insurance premiums.	No.
Baer, H., and E. Brewer, 1986, "Uninsured Deposits as a Source of Market Discipline: Some New Evidence," Federal Reserve Bank of Chicago *Economic Perspectives*, September/October, pp. 23-31.	1979:Q4 1982:Q3	37 BHCs	Certificates of deposit	Large CD rates reflect measured bank risks (i.e., measures of the level and variability of stock prices) in a plausible fashion.	Yes.
Cargill, T. G., 1989, "CAMEL Ratings and the CD Market," *Journal of Financial Services Research*, 3, pp. 347-358.	1984-86	58 banks	Certificates of deposit	Large CD rates reflect measured bank risks (i.e., CAMEL ratings) in a plausible fashion.	Yes.
Ellis, D.M., and M.J. Flannery, 1992, "Does the Debt Market Assess Large Banks' Risk?," *Journal of Monetary Economics*, December, pp. 481-502.	1982-88	Six large money center banks	Certificates of deposit	Bank CD rates immediately reflect the information impounded in bank stock prices. Even for "too-big-to-fail" banks, a reduction in the asset portfolio's value significantly raises CD risk premia.	Yes.
Gorton, G., and A.M. Santomero, 1990, "Market Discipline and Bank Subordinated Debt," *Journal of Money, Credit and Banking*, February, pp. 119-128.	1983-84	71 BHCs 137 bonds	Subordinated debt	Applied a (nonlinear) contingent claims pricing methodology to the Avery, Belton, and Goldberg (1988) data and found "little support for the presence of market discipline in the subordinated debt market."	No.

APPENDIX C. SUMMARY OF EMPIRICAL STUDIES ON THE EFFECTIVENESS OF MARKET DISCIPLINE EXERTED BY UNINSURED LIABILITIES ON BANKING ORGANIZATIONS *(continued)*

BIBLIOGRAPHIC CITATION	SAMPLE CHARACTERISTICS		UNINSURED LIABILITY	FINDINGS	EVIDENCE OF MARKET DISCIPLINE?
	PERIOD	BANKS, BHCS, OR BOTH?			
Hannon, T., and G.A. Hanweck, 1988, "Bank Insolvency Risk and the Market for Large Certificates of Deposit," *Journal of Money, Credit and Banking*, May, pp. 575-593.	1985:Q1	300 banks	Certificates of deposit	Large CD rates reflect measured bank risks (i.e., the likelihood of bank insolvency, the variability of assets, and bank capitalization) in a plausible fashion.	Yes.
James, C.M., 1988, "The Use of Loan Sales and Standby Letters of Credit by Commercial Banks,"*Journal of Monetary Economics*, 22, pp. 395-422.	1985:Q1	300 banks	Certificates of deposit	Large CD rates reflect measured bank risks (i.e., leverage, loan loss provisions, and variance of stock returns) in a plausible fashion.	Yes.
James, C.M., 1990, "Heterogeneous Creditors and the Market Value of Bank LDC Loan Portfolios," *Journal of Monetary Economics*, 25, pp. 325-346.	1986:Q1-1987:Q2	23 banks	Certificates of deposit	Large CD rates reflect measured bank risks (i.e., bank asset risk, domestic loans-to-total capital) in a plausible fashion. A negative relationship between large CD rates and the ratio of foreign loans to capital was interpreted as evidence of an implicit government guarantee on foreign loans.	Yes.
Keeley, M.C., 1990, "Deposit Insurance, Risk, and Market Power in Banking," *American Economic Review*, 80, pp. 1183-1200.	1984-86	77 largest BHCs	Certificates of deposit	Large CD rates reflect measured bank risks (e.g., market-value-of capital-to-assets ratio) in a plausible fashion.	Yes.

APPENDIX C. SUMMARY OF EMPIRICAL STUDIES ON THE EFFECTIVENESS OF MARKET DISCIPLINE EXERTED BY UNINSURED LIABILITIES ON BANKING ORGANIZATIONS *(continued)*

BIBLIOGRAPHIC CITATION	SAMPLE CHARACTERISTICS		UNINSURED LIABILITY	FINDINGS	EVIDENCE OF MARKET DISCIPLINE?
	PERIOD	BANKS, BHCS, OR BOTH?			
DeYoung, R., M.J. Flannery, W.W. Lang, and S.M. Sorescu, 1999, "The Informational Advantage of Specialized Monitors: The Case of Bank Examiners," mimeo, November.	1986:Q2-1995:Q1	1,079 different banks	Subordinated debt	Subordinated debenture spreads are correlated with accounting-based and market-based risk measures, and recent examination ratings, particularly unexpected downgrades. But, bank examiners routinely uncover value-relevant information about the safety and soundness of banks several months before this information is impounded in debenture prices.	Yes.
Flannery, M.J., and S.M. Sorescu, 1996, Evidence of Bank Market Discipline in Subordinated Debenture Yields: 1983-1991," *Journal of Finance*, September, pp.1347-1377.	1983-91	80 BHCs 3 banks 422 bonds	Subordinated debt	Bank-specific risk measures are correlated with debenture rates over the entire sample period (1983-1991) and, most prominently, in the last 3 years of the sample.	Yes.
Hassan, M. K., 1993, "Capital Market Tests of Risk Exposure of Loan Sales Activities of Large U.S. Commercial Banks, *Quarterly Journal of Business and Economics*, Winter, pp. 27-49.	1984-88	'84: 50 banks 171 bonds '85: 49 banks 137 bonds '86: 48 banks 160 bonds '87: 43 banks 174 bonds '88: 49 banks 223 bonds	Subordinated debt that is noncallable	Bank-specific accounting risk measures are correlated with implied variances that are calculated by incorporating default risk-premium into the subordinated debt pricing model of Gorton and Santomero. Subordinated debt holders appear to price loan sales as risk-reducing bank activities.	Yes.

APPENDIX C. SUMMARY OF EMPIRICAL STUDIES ON THE EFFECTIVENESS OF MARKET DISCIPLINE EXERTED BY UNINSURED LIABILITIES ON BANKING ORGANIZATIONS *(continued)*

BIBLIOGRAPHIC CITATION	SAMPLE CHARACTERISTICS		UNINSURED LIABILITY	FINDINGS	EVIDENCE OF MARKET DISCIPLINE?
	PERIOD	BANKS, BHCS, OR BOTH?			
Hassan, M. K., G.V. Karels, M.O. Peterson, 1993, "Off-Balance Sheet Activities and Bank Default-Risk Premia: A Comparison of Risk Measures," *Journal of Economics and Finance*, Fall, pp. 69-83.	1984-88	'84: 50 banks 171 bonds '85: 49 banks 137 bonds '86: 48 banks 160 bonds '87: 43 banks 174 bonds '88: 49 banks 223 bonds	Subordinated debt that is noncallable	Bank-specific accounting risk measures are correlated with implied variances that are calculated by incorporating default risk-premium into the subordinated debt pricing model. None of the off-balance-sheet measures considered were found to be correlated with these implied variances.	Yes.
Jagtiani, J., G. Kaufman, and C. Lemieux, 1999, "Is the Safety Net Extended to Bank and Bank Holding Company Debt?: Evidence from Debt Pricing," Federal Reserve Bank of Chicago Working Paper, 1998, December.	1992-97	19 banks with 39 noncallable subordinated bonds 41 BHCs with 39 noncallable subordinated bonds and 41 senior note issues	Senior notes and subordinated debt	BHC bonds and bank bonds are priced by the market in relation to their underlying credit risks. This relationship appears to be stronger for BHC bonds.	Yes.

APPENDIX C. SUMMARY OF EMPIRICAL STUDIES ON THE EFFECTIVENESS OF MARKET DISCIPLINE EXERTED BY UNINSURED LIABILITIES ON BANKING ORGANIZATIONS *(continued)*

BIBLIOGRAPHIC CITATION	SAMPLE CHARACTERISTICS		UNINSURED LIABILITY	FINDINGS	EVIDENCE OF MARKET DISCIPLINE?
	PERIOD	BANKS, BHCS, OR BOTH?			
Billett, M., J. A. Garfinkel, and E.S. O'Neal, 1998, "The Cost of Market versus Regulatory Discipline in Banking," *Journal of Financial Economics,* 48, pp.333-358.	1990-95	109 downgraded BHCs	Uninsured deposits and commercial paper	During the quarter of a downgrade, both assets and liabilities of the BHCs declined. While insured deposits increased by 1.42% during downgrade periods, uninsured deposits and commercial paper use decline by 6.56% and 27.9%, respectively.	Yes, but the effectiveness of market discipline is undermined because riskier banks use more insured deposits.
Bliss, R. R,. and M.J. Flannery, 2000, "Market Discipline in the Governance of US Bank Holding Companies," Federal Reserve Bank of Chicago Working Paper.	1986:Q1 1997:Q4	107 BHCs 761 bonds	Subordinated debt	Managerial actions after bond values change are equally likely to increase or decrease the value of a BHC's debt.	No.
Covitz, D.M., D. Hancock, and M.L. Kwast, 2000, "Mandatory Subordinated Debt: Would Banks Face More Market Discipline?" working paper, Board of Governors of the Federal Reserve System, June.	1986:Q2-1997:Q4	Top 50 BHCs in each quarter.	Subordinated debt	Issuance decisions depend on the risk profile of BHCs. And, issuance spreads over comparable maturity Treasury securities are positively correlated with accounting-based and market-based risk measures.	Yes.
Crabbe, L., and M. Post, 1994, "The Effect of a Rating Downgrade on Outstanding Commercial Paper," *Journal of Finance,* March, pp. 39-56.	1986-91	28 BHCs with 41 Moody's downgrades	Commercial paper and large certificates of deposit	The quantity of CP falls dramatically in the weeks after a CP rating downgrade, but the quantity of CDs holds steady.	No, quantity of CDs did not change in response to CP rating downgrade.

APPENDIX C. SUMMARY OF EMPIRICAL STUDIES ON THE EFFECTIVENESS OF MARKET DISCIPLINE EXERTED BY UNINSURED LIABILITIES ON BANKING ORGANIZATIONS *(continued)*

BIBLIOGRAPHIC CITATION	SAMPLE CHARACTERISTICS		UNINSURED LIABILITY	FINDINGS	EVIDENCE OF MARKET DISCIPLINE?
	PERIOD	BANKS, BHCS, OR BOTH?			
Ely, D. P., A.L. Houston, and C.O. Houston, 1995, "Can Financial Markets Discipline Banks? Evidence from the Markets for Preferred Stock," *Journal of Applied Business Research,* January, pp. 59-66.	1984-90	115 BHCs/banks 152 issues of preferred stock	Money-market preferred stock (MMPS) and capital market preferred stock (CMPS)	A depository institution's asset credit risk and profitability are associated with the choice between issuing MMPS and CMPS. Banking organizations offering MMPS tend to have lower profitability and higher credit risk than organizations that issue CMPS. This finding is consistent with the view that the auction process for MMPS allows investors to adjust for shifts in risk profiles by repricing the issue each 49 days. This finding that institution-specific risk influences funding behavior is consistent with market discipline.	Yes.
Jagtiani, J., and C. Lemieux, 2000, "Stumbling Blocks to Increasing Market Discipline: A Note on Bond Pricing and Funding Strategy Prior to Failure, Federal Reserve Bank of Chicago Emerging Issues Series, S&R-98-8R, April.	1980-95	Five banks that failed whose parent BHC had publicly traded bonds outstanding during recent quarters prior to failure.	Certificates of deposit, senior notes, and subordinated debt	The market penalizes failing banks by charging dramatically higher subordinated debt spreads (correlated with accounting-based risk measures) starting approximately five quarters prior to failure. Banks also shifted their funding sources towards insured deposits as their credit ratings deteriorated. Their insured deposits start rising approximately five quarters or more prior to failure. Curiously, however, uninsured CD rates did not appear to rise as the failure date was approached.	Yes, particularly for subordinated debt market. Uninsured CDs were run off before failure, though rates did not incorporate a risk premium.

APPENDIX C. SUMMARY OF EMPIRICAL STUDIES ON THE EFFECTIVENESS OF MARKET DISCIPLINE EXERTED BY UNINSURED LIABILITIES ON BANKING ORGANIZATIONS *(continued)*

BIBLIOGRAPHIC CITATION	SAMPLE CHARACTERISTICS		UNINSURED LIABILITY	FINDINGS	EVIDENCE OF MARKET DISCIPLINE?
	PERIOD	BANKS, BHCS, OR BOTH?			
Jordan, J.J., 2000, "Depositor Discipline at Failing Banks," *New England Economic Review*, March/April, pp.15-28.	1989-95	65 FDIC-insured banks that filed a Call Report in 1989:Q1 and operated for at least 7 quarters before failing.	Certificates of deposit	During the last eight quarters of their operations, failed New England banks offset declines in uninsured deposits with increases in insured deposits. Spreads on jumbo CDs generally rose as each bank's condition deteriorated with the highest spreads observed for banks with significant jumbo CD exposures.	Yes, particularly after the passage of FDICIA.
Morgan, D., and K. Stiroh, 1999, "Bond Market Discipline of Banks: Is the Market Tough Enough?," Staff Report 95, Federal Reserve Bank of New York, December.	1993-98	Banks and BHCs 600 bonds	Subordinated debt	A comparison of the statistical relationship between bond spreads and ratings for banking organizations and for other U.S. firms during 1993-1998 suggests that they are similar, at least for investment grade issues, but fairly weak for the largest.	Yes.

APPENDIX D. SUMMARY OF PUBLIC COMMENTS

On March 10, 2000, the Treasury published in the *Federal Register* a request for comments on the feasibility and appropriateness of mandatory subordinated debt.[77] During the 60-day comment period, only two comments were received, both from major U.S. bank holding companies (hereafter referred to as bank holding companies A and B). This appendix summarizes these comments.

While bank holding company A believed that "improved market discipline is an important part of the regulatory framework, and every effort should be made to ensure adequate and appropriate disclosures," it did not believe that a mandatory subordinated debt policy was necessary or appropriate. This holding company argued that the secondary market already exerts substantial *indirect* market discipline on those institutions "that already issue subordinated debt."

Despite these reservations, bank holding company A did provide some suggestions about how to reduce the costs associated with a mandatory subordinated debt requirement. It advised that (1) a subordinated debt policy should be flexible enough to allow banks and bank holding companies to abstain from the requirement of issuing during market dislocations (e.g., the Asian crisis); (2) subordinated debt issued at either the bank or bank holding company should qualify; (3) the amortization of subordinated debt during its last five years of life for inclusion in tier 2 capital should be dropped; and (4) qualifying tier 2 subordinated debt should be allowed to have an original maturity of less than 5 years. It also opined that supervisors and examiners should be flexible and incorporate "market judgment" when evaluating spread levels for "hard-wired spread levels can be misleading outside the context of the marketplace."

Bank holding company B was also not in favor of a mandatory subordinated debt requirement. It argued that the usefulness of subordinated debt spreads as a supervisory tool for monitoring an individual institution's risk was based largely on theory, rather than on empirical evidence. Bank holding company B noted that its own ratings, both supervisory and public, were not correlated with either senior debt or subordinated debt spreads over comparable maturity Treasury securities. Moreover, it perceived that its own debt spreads had largely been determined

[77] See 65FR13077 (March 10, 2000).

by market factors, such as prevailing interest rates, bond market conditions, and macroeconomic conditions, in recent years. Bank holding company B inferred from these observations that (1) the practical issues associated with disentangling the separate influences of market factors and of changes in the risk profile of a financial institution on its debt spreads would make such debt spreads a poor tool for supervisory monitoring purposes; and (2) "the cost of requiring large financial institutions, collectively, to issue subordinated debt would far outweigh any benefit to the agencies."

APPENDIX E. RELEVANT SECTION OF THE GRAMM-LEACH-BLILEY ACT

SEC. 108. USE OF SUBORDINATED DEBT TO PROTECT FINANCIAL SYSTEM AND DEPOSIT FUNDS FROM ``TOO BIG TO FAIL" INSTITUTIONS.

(a) Study Required.--The Board of Governors of the Federal Reserve System and the Secretary of the Treasury shall conduct a study of--

(1) the feasibility and appropriateness of establishing a requirement that, with respect to large insured depository institutions and depository institution holding companies the failure of which could have serious adverse effects on economic conditions or financial stability, such institutions and holding companies maintain some portion of their capital in the form of subordinated debt in order to bring market forces and market discipline to bear on the operation of, and the assessment of the viability of, such institutions and companies and reduce the risk to economic conditions, financial stability, and any deposit insurance fund;

(2) if such requirement is feasible and appropriate, the appropriate amount or percentage of capital that should be subordinated debt consistent with such purposes; and

(3) the manner in which any such requirement could be incorporated into existing capital standards and other issues relating to the transition to such a requirement.

(b) Report.--Before the end of the 18-month period beginning on the date of the enactment of this Act, the Board of Governors of the Federal Reserve System and the Secretary of the Treasury shall submit a report to the Congress containing the findings and conclusions of the Board and the Secretary in connection with the study required under subsection (a),

together with such legislative and administrative proposals as the Board and the Secretary may determine to be appropriate.

(c) Definitions.--For purposes of subsection (a), the following definitions shall apply:

(1) Bank holding company.--The term ``bank holding company'' has the meaning given the term in section 2 of the Bank Holding Company Act of 1956.

(2) Insured depository institution.--The term ``insured depository institution'' has the meaning given the term in section 3(c) of the Federal Deposit Insurance Act.

(3) Subordinated debt.--The term ``subordinated debt'' means unsecured debt that--

(A) has an original weighted average maturity of not less than 5 years;
(B) is subordinated as to payment of principal and interest to all other indebtedness of the bank, including deposits;
(C) is not supported by any form of credit enhancement, including a guarantee or standby letter of credit; and
(D) is not held in whole or in part by any affiliate or institution-affiliated party of the insured depository institution or bank holding company.