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The Role of Subordinated Debt in Market Discipline: The Case of Emerging Markets

Cem Karacadag and Animesh Shrivastava

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Prepared by Cem Karacadag and Animesh Shrivastava¹

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Abstract

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This paper evaluates the potential role of mandatory subordinated debt (MSD) in enhancing market discipline in emerging markets. The conceptual merits and key preconditions of MSD are first reviewed. Then, the extent to which emerging markets satisfy these preconditions—among them the monitorability of bank assets, the presence of nonbank financial investors, and liquid and “clean” capital markets—are evaluated. We find that emerging markets do not satisfy the preconditions for the successful implementation of a MSD policy. Therefore, efforts to enhance market discipline should first focus on satisfying these preconditions and improving the overall incentive environment and market infrastructure.

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Corresponding Authors: ckaracadag@imf.org, a.shrivastava@reading.ac.uk

¹ Cem Karacadag is an Economist in the Financial Systems Surveillance II Division of the IMF's Monetary and Exchange Affairs Department, and Animesh Shrivastava is a Lecturer in the Department of Economics at the University of Reading. We wish to thank Linda Allen, Mark Flannery, George Iden, Alain Ize, Steven Seelig, and Andrea Sironi for their valuable insights and comments on an earlier draft of this paper. Special thanks are due to Michael Taylor, who played a key role in the inception of the paper.

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I. INTRODUCTION

In its new capital adequacy framework, the Basel Committee assigns market discipline an explicit and vital role as one of the three “pillars” of capital regulation along with minimum capital requirements and supervisory review of capital adequacy (BIS, 1999). Despite the growing recognition of market discipline’s importance to banking soundness, the means by which it can best be achieved are still unknown. While the Basel Committee has called for adequate disclosure as a precondition for market discipline, disclosure alone is not enough. Incentives must exist for market agents to analyze available information and *exercise* discipline.

Mandatory subordinated debt (MSD) proposals have re-emerged to provide the incentive for the exercise of market discipline, especially in emerging markets where supervisory capacities are weak.² Requiring banks to issue subordinated debt (“sub-debt”), it is argued, will provide the incentive mix needed to operationalize market discipline. Most papers on the issue, however, evaluate MSD in the context of the experience with sub-debt and financial market conditions in the U.S., with only a few focusing on other countries. This paper endeavors to fill the gap with respect to emerging markets.

As we attempt to show, the conclusion by MSD advocates, particularly the U.S. and the European Shadow Financial Regulatory Committees, that MSD would be an effective tool to enhance market discipline worldwide is questionable. We assess MSD’s applicability to a range of developed and developing financial markets in order to inform the debate on whether MSD should become an integral component of the revised capital standards.

MSD schemes aim to create a class of investors whose incentives are aligned with those of supervisors and deposit protection agencies, and who have an incentive to analyze, monitor, and exert discipline over banks. The proposals call for banks to publicly issue a minimum amount of sub-debt, in the range of 2-5 percent of total assets, and with a maturity no less than 1 year, but as high as 5 or 10 years. Investors in a junior, uninsured claim against banks, in turn, would have strong incentives to evaluate issuing banks, and incorporate their risk assessment into the price at which they are willing to buy banks’ sub-debt. Discipline would be exerted on banks through the risk premia they pay on their sub-debt, a form of discipline commonly referred to as “direct” discipline (FRB, 1999).

MSD offers to enhance market discipline also through the information content of sub-debt prices in primary and secondary markets. To the extent that observable debt prices reflect the relative risk profile of issuing banks, regulators and depositors can act on the basis of that information. For instance, regulators can take corrective actions against banks judged

² See Calomiris, 1997; Federal Reserve Board (FRB), 1999; U.S. Shadow Financial Regulatory Committee (SFRC), 2000.

to be risky by markets, while depositors can withdraw their funds. This form of pressure facilitated by market-based information has been termed “indirect” discipline.

In principle, MSD has important advantages over equity and deposits in bringing market pressure to bear on banks in a manner consistent with prudential objectives. Whereas shareholders face a symmetric risk-return trade-off, sub-debt holders have much to lose on the downside of a high risk strategy, but are not rewarded on the upside. Insured depositors, on the other hand, have limited downside risk to begin with and therefore have no incentive to analyze, monitor and discipline banks.

This paper evaluates the conceptual merits of MSD and explores the institutional constraints to its implementation in emerging markets. These limitations are explored by first defining market discipline. Then, the building blocks of MSD schemes and how MSD can strengthen market discipline in an ideal setting are outlined. Evidence on market discipline in general and sub-debt markets in particular, where available, is also reviewed. On this basis, we turn to the preconditions for the successful implementation of MSD, key among them being liquid capital markets and the existence of large nonbank financial intermediaries as potential third-party arms-length investors in sub-debt. In the absence of nonbank financial investors, there is no base from which to create a separate and distinct class of third-party monitors. Without liquid markets, supervisors cannot extract meaningful price information with which to differentiate the riskiness of banks and act accordingly. Finally, we evaluate whether these conditions are satisfied in developed and developing financial markets.

To the extent that these conditions are not in place, two questions are advanced. First, should a variant of MSD be considered, whereby sub-debt is issued in the international capital markets, instead of potentially illiquid domestic capital markets. Second, should MSD be viewed in the context of a broader set of measures—including adequate accounting and audit standards, incentives for timely and accurate financial disclosure, and a risk-based financial safety net—upon which market discipline and the effectiveness of MSD depend, regardless of whether the specific preconditions for MSD are in place.

II. MARKET DISCIPLINE AND MSD: THEORY AND PRACTICE

Market discipline contains two distinct components (Bliss and Flannery, 2000). The first is investors’ ability to conduct timely risk assessments of banks and the supervisory framework. Price signals by investors, in turn, aim to deter banks from excessive risk-taking, before risk-reducing measures are forced upon them by regulatory actions or deposit runs. Investor analysis contributes to banking soundness also by sharing the burden with supervisors of evaluating the risk profile of increasingly complex and diversified financial institutions. Finally, investor assessments of supervisory frameworks can serve the purpose of reviewing the reviewers and thus provide supervisors with incentives to conduct their responsibilities rigorously and even-handedly in the face of political pressure from banks and other interested parties.

In principle, investor assessments have the potential of being more accurate, timely, and transparent than supervision and regulation. They can be more accurate because, so long as markets are not at an informational disadvantage, the collective judgment of the market, reflecting numerous participants, is likely to be more accurate than that of the supervisory authority. They can be more timely in their manifestation and impact (i.e., cost to banks) because markets are insulated from political pressures and career concerns that tend to delay supervisory action. They are more transparent because market views are public on a real-time basis, whether they be in stock prices, sub-debt prices, or uninsured depositor behavior. The transparency of markets has the added advantage of shifting the burden of proof to managers who must demonstrate their bank's soundness. Otherwise, supervisors would have to show that a bank is unsafe to legislative or judicial bodies (Wall, 2000). In order for market discipline to fulfill its potential role, however, markets require: (1) complete and timely information; (2) an incentive to thoroughly analyze and monitor banks; and (3) an instrument through which their risk assessment can be transformed into financial and reputational incentives for banks to avoid excessive risk-taking.

The second component of market discipline is bank managers' responsiveness to investor feedback channeled through sub-debt prices. Clearly, this is the ultimate goal and test of policies designed to instill market discipline. This paper, however, does not delve into this issue other than to summarize the findings of Bliss and Flannery (2000) on firms' response to investor signals in the U.S. References to market discipline hereafter correspond to the first component only.

Despite its *potential* advantages, market discipline only can complement, not supplant supervision. Market discipline and supervision are not perfect substitutes because market participants' and the government's stakes in the financial system are not perfectly aligned. Even if MSD schemes endeavor to align markets' and supervisors' incentives from a qualitative perspective, the magnitude of their respective stakes would remain far apart. The government's stake in a sound financial sector stems from a wide array of factors, including the financial safety net (deposit insurance, liquidity facilities, payments system) and the importance of banks to savings, investment, and overall economic growth. Supervisory authorities also have the capacity to impose more forceful disciplinary action to protect the interest of the public at large. Evidence from the U.S., where market discipline is arguably at its best, suggests that neither supervisors, nor rating agencies nor equity investors are unambiguously more timely and accurate in their risk assessments than the others. All three groups produce valuable complementary information that contribute to improving the performance of large banks (Berger et al, 1998).

A. MSD in Theory

MSD proposals intend, above all, to build market agents' stake in the soundness of banks in a manner that their current liability structures—comprising mainly depositors and shareholders—do not provide. Shareholders inherently have a stake in a bank's financial performance, but one that prioritizes profit-maximization, subject to the owners' risk tolerance as an investor. Shareholders thus have greater incentives to pursue a high-risk

business strategy given that the risk of losses is balanced by the potential for gains commensurate with the level of risk assumed. While bank capital from a regulatory viewpoint serves a wider range of purposes, including a cushion against losses and the protection of depositors, shareholder investment decisions focus primarily on financing the bank's business and maximizing its profits.

Insured depositors, on the other hand, have no stake in banks' soundness or performance, given the protection afforded by deposit insurance. By contrast, uninsured depositors have in theory something to lose and therefore have an incentive to monitor banks, but are not an effective source of discipline. First, uninsured depositors can perceive to be and in fact often are protected during systemic crises, especially when the banks involved are considered "too big to fail." Second, even if uninsured depositors exerted timely discipline, it carries the risk of destabilizing runs against banks. Third, evidence from the U.S. suggests that banks often shield themselves against the "discipline" (i.e., higher interest rates) of uninsured deposits by shifting their funding sources towards insured deposits as their financial profiles weaken (Billett et al, 1998).

Sub-debt combines the positive attributes of capital and uninsured deposits, but avoids some of their pitfalls. First, as a junior claim compared to both insured and uninsured deposits, sub-debt provides a cushion against losses and added protection for all deposits. Second, as a longer term claim compared to uninsured deposits, sub-debt is a more stable source of funding incapable of being liquidated on the spot and precipitating a contagious run against banks. Third, and most important, sub-debt creates a class of investors whose incentives are aligned with those of supervisors and the deposit protection scheme. As a nominal fixed claim, sub-debt offers no upside potential for investors, but carries downside risk in the event of bank insolvency, given its junior, uninsured, and unsecured status.

The threat of financial loss to investors creates the incentive to influence bank management and behavior. The new class of "stakeholders" have a financial incentive to demand adequate disclosure by banks, to collect the available information on them, and to analyze gathered information. The risk assessment can then be factored into the price at which potential investors are willing to buy and sell sub-debt. The resulting discipline takes two forms, direct discipline and indirect discipline (FRB, 1999). Direct market discipline is the pressure applied by investors on banks through the interest paid on sub-debt, which, in turn, reflects each bank's risk profile. The higher its risk profile, the higher the interest rate the bank will be obliged to pay on its sub-debt. Banks not only are "punished" for maintaining high risk profiles, but the *ex ante* anticipation of higher funding costs can help deter risk-taking behavior (FRB, 1999).

Indirect discipline is the pressure applied by regulators on the basis of trends in sub-debt prices in the secondary market. To the extent that prices reflect the absolute or relative probability of loss by issuing banks, they can provide valuable input into decisions by supervisors and counterparties affecting the bank. For example, the frequency and intensity of on-site examinations and off-site surveillance, bank-specific minimum capital requirements, supervisory ratings, and corrective measures could be based in part on the rates

paid on sub-debt. In effect, through their price signals on sub-debt, investors could help supervisors assess the condition of issuing banks. This role could be beneficial particularly in emerging markets where regulators suffer from weak incentives, insufficient independence, poor training, and inadequate resources.

Even where supervisors are adept at gathering and analyzing information and assessing banks' riskiness, independent, objective, market-based criteria for intervention could limit the scope for regulatory forbearance. Secondary market prices could serve as binding or quasi-binding "triggers" for regulatory action, complementing possible accounting triggers exemplified in FDICIA (Lang and Robertson, 2000 and U.S. SFRC, 1999). One problem with the use of market prices as binding triggers is the possibility of conflict between the required regulatory action by debt prices and the regulatory action considered advisable by supervisory judgment. Recognizing this possibility, the U.S. SFRC acknowledges the risk of misguided regulatory actions based on "false" price signals, while Lang and Robertson advocate the need for regulatory discretion. Supervisory judgment ultimately would supersede the stance of the market, but still, supervisory judgment would be more accountable in instances when it disagrees with the market.

Even though prices are influenced by factors independent of bank riskiness, which reduce their information content, *relative* prices still could be informative. One variant of the proposals suggests that debt prices be interpreted in relation to the average debt price of issuers carrying a benchmark rating (e.g., 'BBB'), thus "normalizing" the volatility in absolute prices (U.S. SFRC, 1999). This option would be available only where a sufficient number of banks are rated at the benchmark rating by reputable rating agencies.

Another variant of the schemes proposes that the amount of interest paid on sub-debt be capped at a spread over the domestic "riskless" rate (Calomiris, 1997). A cap on spreads would force banks to lower their riskiness to levels acceptable to the market by downsizing assets. Given the obligation to issue a minimum amount of sub-debt relative to total assets, if a bank's risk level prevented it from issuing the required amount within the spread limit, it would be forced to shrink its risky on-and off-balance sheet assets until its risk profile reached a level the market could bear at or below the maximum spread (U.S. SFRC, 1999).

Proposals to date, however, have not addressed the inherent bias against risk-aversion by sub-debt holders and its implications for banks. Given the nature of return streams associated with debt and equity, it is well-known that equity holders are biased towards excessive risk-taking (especially when the firm is performing badly) and debt holders towards excessive risk aversion. In corporate governance systems of nonfinancial firms, these opposing biases are harnessed through a system of contingent controls: in normal times, when the firm is solvent and debt holders can receive their full returns, shareholders' interest and hence control predominates; in bad times of low solvency when debt holders stand to lose, debt holders' interest and control predominate (Dewatripont and Tirole, 1993). Note, in particular, that no control is exercised by debt holders in normal times, presumably because this would lead to excessively conservative decision-making. Institutionally, this system of

contingent controls is established through bankruptcy laws, which delineate the conditions under which effective control passes from equity to debt holders.

However, the MSD proposals do not envisage any analogous system of contingent controls. Sub-debt stocks have to be maintained continuously and their continuous pricing in secondary markets exerts direct and indirect effects on bank governance. This is analogous to bondholders having a say in corporate governance of firms all the time and is likely to impart an inefficient (or excessive) risk-averse bias to the decisions of a firm. This can lead to insufficient expansion of banking which will be socially costly, especially in developing countries where access to external capital is limited and bank loans are the predominant source of investment financing.

B. MSD in Practice

Despite the prudential arguments behind MSD, putting MSD into practice raises several technical implementation challenges. The maturity of sub-debt must be long enough to ensure that it is a stable source of funding and not “runnable.” However, requiring banks to issue debt with a minimum maturity could create moral hazard problems by disarming investors ability to redeem their claims upon demand, which is a powerful deterrent against excessive risk-taking (Wall, 2000).³ Wall suggests that one way of mitigating this problem would be to provide at least some sub-debt holders with a put option so that a strong signal could be sent once investors detected signs of trouble.

Another factor in favor of shorter maturities is the desirability of frequent re-pricing in the primary markets. While prices are generated continuously in the secondary markets assuming sub-debt is actively traded, primary market issuance has two distinct advantages. It leads to greater disclosure by banks and to more in-depth analysis by investors (FRB, 1999). Hence, the maturity should be short enough to necessitate frequent issuance and re-pricing.⁴ In addition, uniformity on maturity and contract type among debt issues would be needed to generate prices that are comparable among banks.

³ Wall (2000) references studies by Calomiris and Kahn (1991) and Flannery (1994), which show that debt designed to reduce risk-taking should have a short maturity to force risky banks to face the prospect of debt redemption before their gamble matures.

⁴ Others argue that long-term debt holders may have greater incentives to monitor bank risk-taking, and that secondary market prices carry deeper discounts compared to primary market prices (Lang and Robertson, 2000). The maturities advocated by the proposal range between 1-10 years, with the upper bound derived from the U.S. experience where the most common maturity of sub-debt issued by banks is 10 years. Clearly, the longer the maturity, the larger the required amount of sub-debt, and thus the larger the banks must be in order to necessitate relatively frequent issuance.

Sub-debt issues also need to be sizable enough to be actively traded to permit price generation and the extraction of timely and meaningful information. This, in turn, means that banks subject to MSD should be large enough to make sizable debt issues possible. In the context of the U.S., most proponents of MSD agree on subjecting only large banks to a MSD policy for several reasons (FRB, 1999; Meyer, 1999; Lang and Robertson, 2000). First, a limited number of large banks comprise the bulk of banking assets, and therefore applying MSD to large banks secures the greatest regulatory benefit at the lowest cost to the banking system. Second, only large banks can be expected to issue sub-debt of sufficient size to be actively traded. Market participants in the U.S. indicate that a possible cut-off point for bank size may be US\$50 billion in total assets (FRB, 1999), and that sub-debt issues of US\$150 million or more are liquid in the secondary markets (Meyer, 1999). The U.S. SFRC, by contrast, proposes that the requirement apply to banks with assets greater than US\$10 billion (U.S. SFRC, 1999).

A third reason to confine MSD to large banks is the relatively high cost of issuing sub-debt for small banks. While underwriting costs may be manageable for large banks given the size of their debt issues, small banks may find the fixed underwriting costs more burdensome. Moreover, all else being equal, smaller banks pay higher spreads on sub-debt than their larger counterparts, in part because small debt issues are less liquid (FRB, 1999).

Even when sub-debt is actively traded in a deep secondary market, MSD has drawbacks. First, price signals emitted by sub-debt may trigger deposit runs and destabilize the system as a whole, preempting a preventive soft-landing through indirect discipline on banks. Second, prices are sensitive to cyclical and technical factors, especially in times of distress and crisis. Market microstructure theory indicates that the price of any financial asset is partly dependent on the market and institutional arrangements underpinning its trading. Thus, the degree of market liquidity and transparency, the number of market makers, and inventory considerations can influence prices. While benchmarking prices to a core group of debt issues rated "BBB" (or otherwise) can adjust for the cyclicity of prices, benchmarking outside of the major G-10 countries is likely to be hampered by the small number of banks rated by reputable agencies at the benchmark level, and whose debt is liquid in the secondary markets. Even if benchmarking is feasible, contracting out such a key aspect of indirect market discipline to rating agencies raises the question of whether market discipline should rely more heavily on an obligation to obtain ratings as a complement to MSD. During periods of distress, contagion, herd behavior, and hype are likely to overwhelm fundamental investment factors in price determination. Although *relative* prices should be informative even when absolute prices are not, evidence suggests that markets tend to price indiscriminately or exaggerate differences in creditworthiness in bad times, undermining the information content of relative prices as well.

The well-known deficiencies of sub-debt markets and pricing have caused some to suggest that traded equity shares might serve the role envisaged for sub-debt and that equity prices be used to gauge the market's assessment of banks. The principal difficulty with using equity is that the relationship between equity prices and bank riskiness is hard to interpret (Evanoff and Wall, 2000). An increase in bank risk-taking could result in higher or lower

equity prices depending on the level of risk at the outset. At lower levels of risk, equity prices may fall in response to greater risk-taking as shareholders bear the full risk. At higher levels of risk, creditors increasingly will share the potential cost of the gambles, causing equity prices to rise if the upside potential is thought to exceed downside risks. More generally, equity price movements will depend on shareholders' view of the likelihood of success and the magnitude of the potential reward, regardless of the starting risk level. By contrast, sub-debt prices will always move inversely to bank riskiness.

Another potential challenge presented by MSD is the incentive it creates for issuing banks to influence price setting on their sub-debt. Affiliate or related party investment in sub-debt with the intent of artificially boosting a bank's sub-debt price would undermine both the direct and indirect forms of market discipline. Thus, a MSD policy would have to include strict and enforceable fire-walls on potential investors to ensure that sub-debt purchases are made by unaffiliated third-party entities.

C. Evidence on Subordinated Debt

Empirical studies on sub-debt as an instrument of market discipline are limited almost entirely to the U.S. Nevertheless, financial markets' long-standing experience with sub-debt, the natural growth of the sub-debt market, and the depth of capital markets in the U.S. provide valuable insights from which to evaluate the potential use of MSD in other countries.

The evidence in favor of sub-debt is mixed. One analysis of sub-debt yields on 422 debt issues for 83 large U.S. banking firms found rates to be correlated with bank-specific risks over the sample period of 1983-1991 (Flannery and Sorescu, 1996). Furthermore, the correlation strengthened over the sample period as conjectural government guarantees diminished over time, underscoring the importance of investors perceiving their investments to be at risk in order to impose market discipline.

A more recent empirical study reports more mixed results, however. During 1989-1992, banking organizations apparently revealed a preference for not issuing sub-debt when their risk profile increased, implying that an obligation to issue would have imposed a penalty. In 1993-1997, however, sub-debt issuance was found to be positively correlated with riskiness measured by accounting-based risk measures (a counter-intuitive result), leading the authors to conclude that "market discipline appears to have been relatively weak during this period of favorable market conditions" (FRB, 1999, p. 23). This finding is consistent with the observation that spreads tend to fluctuate within a narrow band during good times, thus making it difficult to differentiate among banks. In bad times, by contrast, spreads surge altogether for risky and less-risky banks alike. Overall, the analyses of sub-debt issuance and prices support the presence of direct market discipline in the U.S., but price signals do not appear sufficiently "clean" to serve as a basis for indirect market discipline by supervisors.

In Europe, recent empirical studies suggest that direct market discipline is far from well-established (Sironi, 2000a), while indirect market discipline is wholly inoperative owing to the illiquidity of the secondary market for sub-debt (Sironi, 2000b). Sironi finds that

sub-debt spreads are correlated with ratings assigned by credit rating agencies, but spreads were not found to be correlated with accounting measures of bank riskiness (Sironi, 2000a). Accounting measures have no explanatory power for spreads, whether or not they are accompanied by ratings on the right-hand side of the econometric specification. Several plausible reasons are offered. First, ratings may be based on more extensive analysis than is generated by statistical models that rely on data alone. Second, qualitative factors such as management are incorporated into rating analyses. Third, ratings are forward-looking opinions of default risk, whereas financial statistics are lagging indicators. These points suggest that ratings may be superior composite measures of bank creditworthiness, altogether obviating the need for investors to analyze indicators of banks riskiness.

In fact, European investors may be doing just that, i.e., pricing sub-debt according to credit ratings, rather than on the basis of their own risk analysis. If this is true, then spreads in the primary market would contain no additional information beyond what is already captured by ratings. The lack of thorough analysis, monitoring, and continuous pricing by investors, in turn, may be a key reason why the secondary market for bank sub-debt is illiquid in Europe.

Clearly, the truth lies somewhere in between. Investors do analyze the credit-standing and performance prospects of the issuers in which they invest. But, for two reasons, the depth, accuracy and timeliness of the analyses may not deliver sufficient marginal benefit to warrant introducing a MSD. First, gathering and analyzing information is costly and the market for information and risk analyses is characterized by externalities that limit the production of high quality risk analysis. Given the vast amounts of free research by (arguably biased) sell-side analysts, market participants often “free-ride” off those that do their homework, but to the extent that everyone does the same, few may be producing analysis that adds value. Second, some of the basic prerequisites of direct market discipline—including complete, timely, comparable information on banks’ asset quality—may not be in place. For example, in Europe, accurate and comparable information on asset quality and loan loss provisioning is unavailable (Sironi, 2000a).

Even where sub-debt prices are correlated with banks’ risk profiles—especially in the U.S.—this does not establish the direction of causality between market discipline and sub-debt or indicate that sub-debt contributed to instilling market discipline in the U.S. Instead, it is arguable that the depth and sophistication of U.S. capital markets are the real underpinnings of market discipline, and sub-debt is merely an instrument through which financial and reputational incentives for banks to reduce risk-taking are transmitted.

The distinction between the two interpretations—sub-debt as cause of market discipline versus sub-debt as transmitter of market discipline—is crucial. To the extent that sub-debt is effective only in transmitting market discipline, then the question of MSD turns on whether the conditions for market discipline are already in place and not whether MSD can create market discipline. Though MSD can foster the conditions for market discipline, drawing a clear distinction on sub-debt’s role highlights the key point that MSD is not a panacea for financial systems wholly devoid of market discipline, but may be viewed at best as only one component of a coherent set of policies designed to instill market discipline.

Studies of market discipline outside the U.S. help illustrate this point. These studies are limited in number and none focus directly on sub-debt prices owing to the nascence or complete absence of sub-debt markets. Argentina is the only country that has adopted a MSD policy, but the policy has not been in place long enough to evaluate trends in the sub-debt market. Instead, market discipline is examined through the risk premia demanded by depositors. One paper on Argentina, for example, finds that market perceptions of risk, manifested in deposits rates and flows, are correlated with ex ante measures of bank creditworthiness and with ex post incidence of bank failure (Calomiris and Powell, 2000). The evident market discipline is attributed to an array of policies, including a strictly limited safety net, high minimum capital requirements, the obligation for banks to solicit a credit rating, a "liquidity requirement," free entry of foreign banks, and a sub-debt requirement. But the biggest contributor to the growing market discipline in Argentina arguably is the government's willingness to permit insolvent banks to fail and its cutting back of the protection offered to depositors in recent years. Here, the point is not to argue in favor of or against any specific factor as a contributor to market discipline—which is an empirical matter—but rather to emphasize that the evidence on MSD's potential utility is not decisive. The analysis of even the staunchest advocates of MSD shows that MSD is only one element in a set of policies required to promote market discipline.

Another analysis on Argentina, Chile and Mexico found that bank deposit volumes vary according to banks' creditworthiness, and thus depositors punish banks for risky behavior (Peria and Schmukler, 1999). Importantly, the study shows that market discipline is limited before and during crises, but becomes much more prominent *after* banking crises. The actual experience or danger of real losses by investors, combined with post-crisis reform measures, appears to play a crucial role in engendering market discipline. These findings partially mirror those on the U.S., where market discipline was found to be weak in good times, but stronger during periods of systemic distress.

The studies on both the U.S. and Latin American emerging markets indicate that market discipline may gradually weaken as the memory of the last crisis (or loss experience) recedes. As a result, market discipline may be weakest when it is most needed, i.e., in good times. Thus keeping market discipline alive may ultimately hinge on the supervisory authorities use of every opportunity to take corrective measures against weak banks and to impose losses on unprotected creditors when warranted.

Finally, even when investors send risk-sensitive price signals, there is no clear evidence of bondholders' ability to exert beneficial influence on bank managers in developed market systems. Bliss and Flannery (2000) examine the issue of whether U.S. bank holding companies' security price changes influence subsequent managerial actions. They find that despite statistically significant associations between returns and subsequent managerial actions, the evidence cannot be interpreted as supporting exercise of beneficial influence. In fact, for bondholders, instances of beneficial and perverse influence seem equal in number.

III. PRECONDITIONS FOR MSD

Despite the conceptual merits of MSD, the evidence casts doubt on the extent to which it contributes to market discipline. The disconnect between MSD in theory and MSD in practice suggests that the preconditions for MSD's success may not yet be in place or may not be possible to secure altogether. The remainder of this paper outlines a core set of preconditions for implementing MSD and asks whether these conditions prevail worldwide to an extent that would justify MSD's adoption as part of a global banking standard.

First and foremost, bank assets need to be monitorable. Put differently, the type of information required to assess the quality of bank assets needs to lend itself to disclosure *and* a sufficient amount of that information needs to be disclosed. In this context, the adoption of international accounting standards would go a long way towards satisfying the information requirements for MSD.

Second, launching a MSD policy hinges on the presence of nonbank financial intermediaries as potential investors in sub-debt. Moreover, nonbank investors must be large enough to accumulate substantial stakes in banks through sizable investments in sub-debt. Only then will they develop a critical mass of incentives needed to allocate resources to undertake risk assessments of issuing banks.

The mirror image of the second precondition is that sub-debt issues be large enough to be worthwhile for institutional investors to analyze and monitor. This, in turn, means that banks of sufficient size must exist to make large debt issues possible. While there are no clear-cut rules on the minimum size of banks, the U.S. experience provides certain benchmarks that can help evaluate the applicability of MSD worldwide (see below).

A third precondition is that investors believe their investments in sub-debt are at risk.⁵ Otherwise, they will have little incentive to price risk. Investor perception of risk, in turn, hinges on a range of factors, among them the authorities' track record on handling insolvent banks and the design of the financial safety net. To the extent that some banks are considered "too big to fail" and the authorities have a track record of bailing out insolvent institutions (including by protecting uninsured depositors and creditors), investors are unlikely to perceive a risk of loss to their investment in sub-debt.

Fourth, capital markets must be liquid enough to accommodate primary market issuance and facilitate secondary market trading. The absence of active trading of sub-debt could mean that any one of the three preceding preconditions are not in place. First, domestic

⁵ Conversely, sub-debt holders must also have faith that supervisors are capable of diagnosing bank unsoundness in an accurate and timely manner, and are willing to close weak banks before they become insolvent, as a matter of policy. Otherwise, the high risk of loss may elevate risk premia demanded on sub-debt to unsustainably high levels.

capital markets—in terms of the size and sophistication of nonbank investors—may be undeveloped. Second, the size of the sub-debt issues may be too small to be worth analyzing and to be traded. Third, investors may not perceive their investments to be at risk. Regardless of the underlying reasons, without secondary market trading, sub-debt prices will not be generated and indirect discipline will not be exerted.

Finally, the regulatory framework for financial institutions and the securities markets need to be robust enough to ensure that markets are not manipulated. For example, to the extent that increases in spreads may precipitate corrective supervisory actions, issuing banks will have a strong incentive to manipulate sub-debt prices, possibly through arranging related parties to invest in their debt. Therefore, strong fire-walls between banks and their subsidiaries and strong securities regulations (e.g., against insider trading) are essential to the effective implementation of a MSD policy.

IV. ARE THE PRECONDITIONS FOR MSD SATISFIED?

This section examines whether the key preconditions for MSD are satisfied. First, we focus on the “monitorability” of banks assets. Then, we turn to the presence of nonbank investors as potential third-party monitors. In the absence of domestic institutional investors, we consider whether foreign financial investors can substitute for local ones and act as agents of discipline for domestic banks. Finally, we examine the size of capital markets to ascertain whether they are deep enough to absorb sub-debt issues and generate meaningful prices at issuance and beyond.

A. Monitoring Banks

Banks differ from nonbank financial intermediaries (as well as nonfinancial firms) because the quality of their assets cannot be easily scrutinized by outsiders. Bank finance, especially in developing countries, involves relational lending as opposed to arm’s-length transactions, an important ingredient of which is “tacit information” arising from networks, relationships, and direct experience (Aoki, 1999). The uniqueness of banks lies not in the finance, insurance or liquidity functions they provide (given the increasing competition in each of these functions) but in their investment in relationships with clients (Diamond and Rajan, 1999) and the investment in reputation (Boot et al, 1993). These, in turn, allow banks to obtain and process tacit information (Rajan, 1998). Hence, monitoring banks’ asset quality requires access to local, relation-specific, and nonquantifiable information, which may not be possible to reveal through disclosure requirements, transparency or other measures, which improve information, for example, on equities (Aoki, 1999).

As such, external debt holders will find it much harder to monitor banks compared to nonfinancial firms (Simons and Cross, 1991). Although monitoring on the margin is likely in some G-10 economies, the inscrutability of bank assets is more acute in developing countries. Therefore, the U.S. experience with sub-debt, even if considered a success, does not warrant the application of MSD elsewhere.

Differences in the monitorability of bank assets in developed and developing countries underscore the point. First, banks in advanced economies have gradually withdrawn from the provision of loans to the provision of guarantee of liquidity (i.e., back-up lines of credit or letters of credit), thus making their balance sheets less opaque (Rajan, 1998). This trend stems in part from competition from bond markets. As early as 1990, the ratio of nonbank commercial loans to bank-financed commercial loans in the U.S. had reached 75 percent up from 10 percent in 1958 (Gorton and Pennachi, 1995).

Second, primary loans issued by banks in developed economies are more monitorable because of the greater availability of information, more advanced techniques of securitizing and selling loans, and deeper markets. For example, bank loan sales in the U.S. are quite common and there exists a large and liquid market in secondary loans as well. The Loan Pricing Corporation, which facilitates daily mark-to-market process between bank loan dealers and investors, reports an increase in trading volume of secondary loans from US\$8 billion in 1991 to US\$110 billion in 1999. The large scale of market-based debt financing indicates that market participants have the technical and institutional capacity to monitor the riskiness of those debts and the asset quality of the banks making the underlying loans. Further evidence of this is that increasingly banks are in direct competition with capital markets (traditionally a more transparent and monitorable sector) for providing funds.⁶

In contrast to advanced economies, banks are the predominant source of finance in emerging economies. Moreover, the nature of bank monitoring is notably different in emerging economies owing to weak corporate governance and inadequate disclosure and audit systems. It involves an assessment of the organizational and implementation capacity of entrepreneurs and their institutional environment rather than an analysis of the novel commercial or technological ideas for which standardized techniques and various information sources can be used (Aoki, 1999). Organizational and institutional aspects can be best known and monitored in a relational setting, where specific knowledge is extracted from entrepreneurs. The importance of specific knowledge to risk assessment, however, also makes asset portfolios more opaque and difficult to analyze. As a result, the scope for securitization and loan sales has been limited in developing countries.

The difficulty and labor intensity of lending directly to firms may explain why most global financial institutions lent to banks rather than directly to firms prior to the Asian crisis. Rajan and Zingales (1998) argue that given the difficulty of monitoring bank assets, most creditors insured themselves by lending short-term in order to withdraw funds on demand. Similarly, the scarcity of long-term finance in developing countries attests to the challenge of

⁶ The crash of Drexel Burnham and Lambert (DBL) in 1990 caused the share price of major commercial banks to rise by 7 percent whereas price of investment bank shares rose by only 1.6 percent (Benveniste *et al.* 1993). This suggests that activities of DBL were seen more as a substitute to commercial rather than investment banking.

monitoring by domestic banks, which often operate amid inadequate information and unstable macroeconomic or unreliable legal environments (Caprio and Demirguc-Kunt, 1998). Instead, short-term credit is used as an instrument to control borrowers in institutionally deficient financial environments (Diamond, 1991).⁷ Domestic investors in bank debt, even if motivated, are thus constrained in their ability to monitor the riskiness of bank portfolios and exert discipline on banks.

B. Investors in Bank Debt

As noted earlier, a necessary condition for the MSD scheme to work is the existence of a class of investors with the ability and incentive to monitor banks riskiness. In principle, three types of investors could fulfil this role: (a) domestic institutional investors; (b) international investors; and (c) domestic private investors. Each type of investor is considered in turn.

Domestic institutional investors

Evidence on the structure of financial systems worldwide shows that emerging market economies generally lack the sizable nonbank financial intermediaries required to monitor banks and exert discipline on them. The analysis on relative sizes of domestic institutional investors is based on a database constructed by the World Bank on financial development and structure in developed and developing countries (Beck et al, 1999).⁸ Table 1 reports simple averages of commercial bank assets and OFIs' assets for G-10 countries, non-G-10 developed countries, and emerging markets.⁹ The figures are averaged over 1990-1997 and 1995-1997 to normalize for cyclical trends. Given the secular rise in OFIs in emerging markets, 1995-1997 averages are used as a basis for comparison.

⁷ The short tenure of financial intermediation itself may be an obstacle to a MSD policy, which requires debts of longer maturity.

⁸ The database contains indicators on four areas: (a) the size and activity of financial intermediaries (i.e., central bank, commercial banks, and other financial institutions ("OFIs")); (b) OFIs decomposed (insurance companies, private pension and provident funds, and pooled investment schemes); (c) stock and bond market development and (d) the efficiency and market structure of commercial banks. The remainder of this paper draws on indicators on the size of financial intermediaries (i.e., (a) and (b)), and on the size of the bond markets (i.e., (c)).

⁹ Non-G-10 developed countries are defined as countries with a per capita income of US\$10,000 or more, which are not among the G-10 countries. Emerging market countries are defined as countries with a per capita income of under US\$10,000 for which data is available.

The data indicates that OFIs are much larger in G-10 countries in both absolute and relative terms (i.e., share within the financial system) compared to non-G-10 developed and emerging economies. In G-10 countries, commercial banks assets averaged 103 percent of GDP, while OFIs averaged 105 percent of GDP. The relatively larger share of OFIs in the financial system evidences the diminishing dependence on commercial banks and the shift towards equity and bond markets as a source of investment finance in the G-10 economies. By contrast, the size of commercial bank assets and OFIs as a percentage of GDP stood at 83 and 23 for non-G-10 developed countries, and 38 and 17 for emerging markets. Thus, the absolute size of OFIs in non-G-10 developed countries and in emerging markets (at one-fifth of that of G-10 countries) as well as OFIs share in the financial system (at one-half of the G-10 average) are considerably smaller than in the G-10 economies.

Table 1. Assets of Commercial Banks and Other Financial Institutions Around the World

	Commercial Banks	Other Financial Institutions	Other Financial Institutions
	<i>percent of GDP</i>	<i>percent of financial assets</i>	
G-10 Countries (11)			
1990-1997	100.0	100.0	53.4
1995-1997	103.0	105.3	53.2
Non-G-10 Developed Countries (9)			
1990-1997	84.8	21.5	20.6
1995-1997	82.5	22.9	23.7
Emerging Markets (37)			
1990-1997	34.9	13.2	23.1
1995-1997	38.4	16.7	23.6

Source: Database on Financial Development and Structure, World Bank.

Note: See Appendix I for the specific countries included in each category.

Table 2 presents a more comprehensive and accurate picture of OFIs in all three country groupings.¹⁰ Accordingly, OFIs' assets as a percentage of GDP over 1990-1997

¹⁰ In principal, OFIs represented in tables 1 and 2 are the same set of financial intermediaries, and therefore, the sum total of the OFIs in table 2 should equal the OFIs in table 1. However, figures for OFIs in tables 1 and 2 differ significantly, owing to the different sources used. Aggregate figures on the size and activity of financial intermediaries in table 1 are sourced from the IMF's *International Financial Statistics (IFS)*, which, in turn, are based on statistics reported to the IMF by central banks. IFS tends to understate the size of OFIs. Figures on the (continued...)

averaged 116, 76, and 29 respectively, for G-10 countries, non-G-10 developed countries, and emerging markets. These figures confirm that the size of OFIs in emerging markets is much smaller than both G-10 and non-G-10 developed countries.¹¹

It is worth noting that the standard deviation of OFIs' assets within each grouping is very high, suggesting that within each category there are some countries with large OFI sectors and others with very small OFI sectors. For example, among emerging markets, Korea, Malaysia, and South Africa have very large OFI sectors, at 120, 74, 164 percent of GDP respectively, which measurably raises the average for the 23 emerging markets included in the sample. If these three outliers are excluded, the average of OFIs assets in the remaining 20 emerging markets in the sample would be cut in half and amount to only 16 percent.

Finally, it is worth highlighting that the figures reported here constitute "lower bound" estimates for the size OFIs across all three categories, but especially emerging markets. The difficulty of gathering comprehensive information on the nonbanking financial sectors results in the exclusion from the sample of several emerging markets where OFIs are present, and the underestimation of the size of OFIs in some emerging markets in the sample.¹²

Foreign investors

Foreign investors conceivably could perform the third-party monitoring role where domestic capital markets are undeveloped, but there are several causes for concern here. First, international investors have shown little appetite for domestic bonds so far. The bulk of the net private credit flow to developing countries takes the form of international bond issues.¹³ With regard to domestic instruments, foreign investors have preferred equity to debt.

disaggregation of OFI are collected from various national sources and therefore are more complete.

¹¹ Figures in table 1 and 2 are not directly comparable because of the different sample of countries comprising the averages and the different time periods over which figures are averaged. The difference in sample countries stems from data limitations. In table 2, 1990-1996(7) averages are used (instead of the 1995-1997 average in table 1) owing to data limitations for more recent years.

¹² Figures for table 2 were also computed on a weighted basis (weighted by economic size in terms of nominal GNP). The comparative results are even starker on a weighted basis.

¹³ Emerging market borrowers issued US\$109 billion worth of international bonds in 1997, US\$74 billion in 1998 and US\$55 billion in 1999. This is against of background of net private flows (including substantial equity flows) to emerging economies of US\$265.7 billion in 1997, US\$147.8 billion in 1998 and US\$148.7 billion in 1999.

For instance, almost all the pension funds operating in emerging markets invest in equity by buying into existing mutual funds. Only the very largest directly hold debt instruments. Among reasons cited are weaker bond market infrastructure and higher sensitivity of bond prices to macroeconomic conditions (World Bank, 1997).

Second, the behaviour of the pension funds suggests that only a small proportion of pension funds typically treat emerging markets as a separate asset class for their resource allocation. Most invest in emerging markets as part of their international portfolio allocations. According to the World Bank (1997), about 13 percent of the pension funds invested for risk-diversification, and around 40 percent invested for the benefits of both diversification and higher returns. Purchase of developing country instruments as part of a portfolio has two implications. One, there can be market contagion. Kodres and Pritsker (1998) argue that investors with international portfolios can react to market movements in one country by buying or selling assets in another (to dynamically hedge their positions) and cause interconnected market movements even though direct economic links may be absent. Two, herding behaviour may emerge. With globalization, the share of a country's assets in an investor's portfolio may become so small that it is more costly to gather and process information than to follow others' assessments. Calvo and Mendoza (1997) argue that, with internationalization, portfolio managers increasingly will be inclined to imitate some arbitrary portfolio (alternatively, not to check "rumours" in good times), leading to a herding of investment behaviour.

Empirically, the volatility and reversibility of capital flows in the wake of Asian crisis is well documented. Between 1996 and 1997, portfolio equity investment fell from US\$12.4 billion to an outflow of US\$4.3 billion and portfolio debt from US\$78.4 billion to an outflow of US\$14.0 billion. This contrasts with the simultaneous increase of foreign direct investment from US\$6.3 to US\$6.4 billion (World Bank, 1998). Significantly, there is also evidence of spillover effects and herd behavior. For instance, Alba et al (1998) argue that while many of the East Asian countries suffered from structural and policy weaknesses and were financially vulnerable, a large financial crisis was by no means inevitable. The crises were triggered by investor behavior in response to spillover effects from neighboring countries. A study by Levy-Yeyati and Ubide (1998) uses data on the ratio of the price of closed-end country funds to their fundamental value (the market value of the fund portfolio) to examine behavior of international investors relative to domestic investors. It finds that, compared to local investors, international investors are more sensitive to global market conditions and less sensitive to local country conditions.

Table 2. Assets of Other Financial Institutions Around the World

<i>percent of GDP</i>	Total Other Financial Insts.	Other Banking Institutions	Life Insurance Companies	Insurance Companies	Pension & Provident Funds	Pooled Investment Schemes
G-10 Countries (12)						
1990-1997						
Average	116.2	44.2	25.6	36.8	46.0	13.5
Median	109.8	24.9	23.3	35.8	33.0	0.0
STD	74.1	47.4	17.0	16.9	26.0	0.0
1995-1997						
Average	142.3	49.3	39.7	50.7	55.4	22.4
Median	135.7	21.5	31.5	42.1	55.7	0.0
STD	95.3	60.9	21.0	18.0	17.8	0.0
Non-G-10 Developed Countries (12)						
1990-1997						
Average	75.8	38.5	9.3	15.9	...	...
Median	60.0	28.4	17.3	14.4	...	...
STD	58.4	40.6	11.7	11.5	...	...
Emerging Markets (23)						
1990-1997						
Average	29.0	14.4	4.7	6.1	...	...
Median	14.1	7.5	15.7	3.0	...	...
STD	39.9	23.8	25.8	21.0	...	...

Source: Database on Financial Development and Structure, World Bank.

Note: See Appendix I for the specific countries included in each category.

Domestic private investors

Given the weaknesses of institutional investors and the problems associated with foreign investor behavior, domestic private investors can have an important role to play. In general, two conditions have to be satisfied for effective investor action. First, private investors must have a large enough stake to make monitoring worthwhile. Second, they should be incentivized to use their clout to perform faithful monitoring (upon which regulators might rely) rather than secure advantageous terms for themselves. For example, partisan or connected dealing would affect secondary market price of MSD, weakening the relationship to banks' riskiness.

An important dilemma that arises in this context is that whenever there are large stakeholders who can wield influence over a firm, there is a natural tendency for them to exploit their power to secure favorable deals from firms (Johnson et al, 1999). Good corporate governance systems address this fundamental problem by restricting the scope for such behavior through measures to combat practices such as insider trading, market manipulation, selective disclosure of information, and so on. Therefore, in robust governance systems such as in the G-10 countries, it is possible that the actions of MSD holders may provide some market discipline.¹⁴ However, in less developed countries, MSD may fail to produce the same effect due to frailties of the governance system. In other words, creation of large (local) debt holders may not translate into effective monitoring of banks.

In this regard, evidence on the relative weakness of governance systems in developing countries and hence the scope for self-serving behavior can be obtained from the equity market (rather than bond markets, which tend to be poorly developed). Large, concentrated shareholding is more common in developing than developed countries so that the potential for exercise of shareholder power is higher.¹⁵ Control is further enhanced through a number of mechanisms such as cross-holding, pyramid structures and non-observance of the one-share one-vote rule.¹⁶ The use of pyramid structures and

¹⁴ Note that the evidence presented in section IIC is consistent with this possibility.

¹⁵ For example, La Porta et al. (1998) find that average percentage shares held by three largest shareholders in the civil law countries varied from 20 percent for U.S. and 19 percent for U.K. to 40 percent for India and Nigeria, 47 percent for Thailand, 54 percent for Malaysia and 60 percent for Sri Lanka. Similarly, Claessens et al. (1999a) find that in Thailand, Indonesia and Hong Kong the largest blockholders own on average, 33, 26, and 24 percent, respectively, of cash flow rights in firms in 1996.

¹⁶ Claessens et al (1999b) show that in 1996 the shares of top ten families in total market capitalization were 46 percent for Thailand, 53 percent for Philippines and 58 percent for Indonesia.

cross-holdings can allow greater control than suggested by formal stock ownership.¹⁷ However, owing to weaknesses of corporate governance, this concentration of ownership and control does not lead to better monitoring and governance. Actions of large shareholders typically lead to expropriation of minority shareholders rather than contribute to improved corporate governance.¹⁸ Hence, the scope for large stakeholders to behave strategically within the governance systems of developing countries conflicts with their envisaged role as arm-length monitors under a MSD policy.

A final institutional fact to note is that the government is the largest shareholder in commercial banks in many developing countries, which impairs governance. Public ownership politicizes resource allocation, weakens incentives for appropriate management and control, and creates an environment in which other large stakeholders can more easily pursue self-serving deals. In this context, La Porta et al (1999), using data from 92 countries, find that government ownership of banks retards rather than stimulates subsequent financial development, with the effect being more pronounced in the case of less developed countries.

C. Market Depth and Infrastructure

MSD proposals presume the existence of a continuous liquid market in secondary debt in which price discovery occurs. However, the financial, regulatory and legal structures in many emerging markets are not sufficiently developed to make this possible.

Emerging market bond and stock markets are much smaller in size compared to those in developed economies. Table 3 reports figures on the size of the stock and bond markets as a proxy for secondary market liquidity. The data shows that both stock markets and bond markets are much larger in G-10 and non-G-10 developed countries. In 1995-1997, stock market capitalization as a percentage of GDP stood at 83, 76, and 29 in G-10 countries, non-G-10 developed countries, and emerging markets, respectively, while the size of the bond markets (both public and private) stood at 90, 70, and 20. Private bond markets' share in GDP were ranked in the same order: 33 percent for G-10 countries; 24 percent for non-G-10 developed countries; and 9 percent for emerging economies.

¹⁷ For instance, the founder of the Hyundai business group owned only 4 percent of the stock but, through relatives and member companies, could exercise control over 60 percent of stocks (World Bank, 1998, p. 60).

¹⁸ Johnson et al (1999) note that during the crisis of 1997-98, controlling shareholders of firms in emerging markets transferred assets out of companies, diverted profits away from creditors and supported troubled firms in industrial groups using loan guarantees by other listed group members. In a study of 2658 East Asian corporations in 1996, Claessens et al (1999a) find that more concentrated control rights are associated with lower firm valuation, suggesting expropriation of minority claimholders.

In emerging markets, even where private bond markets are relatively large, liquidity may be limited. For example, in Malaysia, which has a large private bond market, there has been little or no secondary trading in private debt securities. Some of the reasons for this are institutional and regulatory: initial offerings have been placed with only a few institutional investors and with restrictions on parties with whom they could trade; and high brokerage costs have meant that retail traders typically hold these paper to maturity. Thus institutional, trading and regulatory arrangements can have a significant impact on secondary markets. More generally, the diversity in the institutional underpinnings of developing country financial markets suggests that mandating issuance of sub-debt would not lead to risk-sensitive pricing in secondary markets that is comparable across borders.

Even though there is no simple benchmark in terms of minimum size before capital markets become liquid, the relatively small size of capital markets in emerging markets, coupled with the modest presence of nonbank financial investors, suggests that conditions may not be ripe for the introduction of MSD until more fundamental preconditions of market discipline are put in place. If introduced into nascent or rudimentary bond markets, MSD would produce little usable information for regulatory purposes.

V. CONCLUSION

The vital role accorded to market discipline in the new capital adequacy framework has sparked a plethora of MSD proposals, largely based on experience with sub-debt in the U.S. This paper has endeavored to shed light on two central questions. First, can a MSD policy help instill market discipline in general? Second, is a MSD policy suitable for emerging markets in particular? The answer to the first question, we argue, is a qualified "yes" and to the second is "no". Therefore, it would be premature to include MSD as part of global capital standard.

A review of the evidence on sub-debt markets suggests that market discipline is only partially evident even in the U.S., where financial markets are the most developed in the world. However, it is arguable that the depth and sophistication of capital markets in the U.S. are the real underpinnings of market discipline, and sub-debt is merely an instrument through which investors exert pressure on banks. In Europe, the presence and efficacy of direct market discipline is far from well-established, while indirect discipline is wholly inoperative, given the illiquidity of the secondary market for sub-debt. In emerging markets, the paucity of countries in which sub-debt is issued, and the short track record of the only country (i.e., Argentina) to have implemented a MSD policy, has precluded an empirical analysis of experience with sub-debt. Instead, the potential role of MSD is evaluated against the background of the preconditions of MSD and the extent to which they are met.

Table 3. Market Depth and Liquidity Around the World

<i>percent of GDP</i>	Stock Market Capitalization	Stock Market Value Traded	Private Bond Market	Public Bond Market	Total Bond Market	Equity Issues	L-T Private Debt Issues	Stock Market Turnover (%)
G-10 Countries (12)								
1990-1997								
Average	66.8	32.2	33.0	52.3	85.2	1.0	4.0	50.2
Median	65.4	28.8	39.5	46.9	79.3	0.6	4.2	47.8
STD	36.1	23.1	17.0	32.1	41.7	1.2	3.4	28.3
1995-1997								
Average	83.3	47.5	32.9	57.5	90.4	0.4	1.4	61.8
Median	81.6	40.5	37.0	54.3	84.3	0.2	1.5	61.8
STD	47.9	36.6	16.3	33.2	44.8	0.6	1.6	33.2
Non-G-10 Developed Countries (14)								
1990-1997								
Average	62.2	31.1	23.8	42.9	66.7	0.9	1.3	58.7
Median	29.8	14.3	12.4	33.1	50.6	0.0	0.4	47.7
STD	53.6	29.5	27.4	17.0	35.5	1.6	1.4	16.8
1995-1997								
Average	75.5	42.0	24.1	46.2	70.4	0.3	0.3	67.7
Median	40.0	21.4	15.0	38.8	55.6	0.0	0.0	52.6
STD	65.0	40.1	26.8	17.9	36.1	0.5	0.4	23.6
Emerging Markets (43)								
1990-1997								
Average	22.9	7.5	6.7	11.7	18.4	1.4	0.9	38.5
1995-1997								
Average	28.8	9.4	8.5	12.0	20.5	0.8	0.7	39.1

Source: Database on Financial Development and Structure, World Bank.

Note: See Appendix I for the specific countries included in each category.

Evidence presented in this paper indicates that emerging markets do not satisfy the preconditions for MSD, which include (1) the monitorability of bank assets, (2) the disclosure of accurate and timely information on asset quality, (3) the substantial presence of nonbank financial investors, (4) the belief by investors that their investments in sub-debt are at risk, and (5) a robust regulatory framework and market infrastructure that ensure the integrity of price discovery mechanisms.

First, bank assets are much less monitorable—given the importance of relation-specific “tacit information” in lending in emerging economies—and the quality of disclosed information is lower. Second, emerging markets generally lack sizable nonbank financial intermediaries required to invest in sub-debt and to monitor banks. Third, emerging capital markets are relatively small and illiquid, lacking the depth required to produce usable information for regulators. Foreign investors cannot reliably perform the functions ascribed to domestic investors and capital markets by MSD, given the herd behavior to which foreign investors are subject and the excessive volatility of cross-border capital flows. Fourth, government bail-outs remain prevalent in emerging markets, and undermine the incentive for investors to price risk diligently. Finally, emerging capital markets are more susceptible to manipulation given the more concentrated ownership structure of emerging economies and the shortcomings of their legal systems.

This conclusion does not imply that sub-debt does not have an important role to play as part of the capital structure of banks. Sub-debt can and should continue to serve as a buffer against losses, particularly in emerging markets where equity capital remains scarce, expensive, and often insufficient against losses incurred under systemic distress. By providing another category of capital available for loss-absorption, sub-debt also can help supervisory authorities adhere to strict “no bail-out” policies, without risking the contagion that could result from imposing losses on depositors.

The important uses of sub-debt notwithstanding, efforts to enhance market discipline in emerging markets should focus first on improving the overall incentive environment and on satisfying the preconditions for a successful MSD policy. Even if the use of sub-debt is encouraged in order to foster deeper sub-debt markets, MSD should not be seen as a panacea for creating market discipline, but rather as one possible element in a set of policies designed to instill market discipline. These policies include high accounting and disclosure standards, incentive compatible financial safety nets, strict no-bail out policies, openness to foreign ownership and competition, and robust legal and supervisory frameworks.

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Countries Represented in Data Samples Reported in Tables 1, 2, and 3

Table 1			Table 2			Table 3		
G-10 (11)	Non-G-10 Developed (9)	Emerging Market (37)	G-10 (12)	Non-G-10 Developed (12)	Emerging Market (23)	G-10 (12)	Non-G-10 Developed (14)	Emerging Market (43)
Belgium Canada France Italy Japan Luxembourg Netherlands Sweden Switzerland United States United Kingdom	Australia Austria Denmark Finland Ireland New Zealand Norway Singapore Taiwan	Argentina Belize Bolivia Brazil Chad Chile China Colombia Costa Rica Cyprus Dominican Republic Ecuador Egypt Ghana Guatemala Honduras Iran Jordan Kenya Korea Malawi Malaysia Mexico Morocco Namibia Nigeria Nicaragua Paraguay Peru Philippines South Africa Thailand Trinidad & Tobago Tunisia Turkey Venezuela Zimbabwe	Belgium Canada France Germany Italy Japan Luxembourg Netherlands Sweden Switzerland United States United Kingdom	Australia Austria Denmark Greece Ireland Israel New Zealand Norway Portugal Singapore Spain Taiwan	Brazil Chile Colombia Dominican Republic Ecuador El Salvador Egypt Guatemala India Kenya Korea Malawi Malaysia Mexico Nigeria Paraguay Philippines South Africa Thailand Trinidad & Tobago Tunisia Venezuela Zimbabwe	Belgium Canada France Germany Italy Japan Luxembourg Netherlands Sweden Switzerland United States United Kingdom	Australia Austria Denmark Finland Greece Hong Kong, SAR Iceland Ireland Israel New Zealand Norway Portugal Singapore Spain	Argentina Bangladesh Bolivia Botswana Brazil Chile China Colombia Cote d'Ivoire Cyprus Czech Republic Ecuador Egypt Ghana Hungary India Indonesia Jordan Kenya Korea Kuwait Latvia Lithuania Mauritius Mexico Morocco Nigeria Pakistan Peru Poland Philippines Russia Saudi Arabia Slovak Republic Slovenia South Africa Thailand Trinidad & Tobago Tunisia Turkey Uruguay Venezuela Zimbabwe