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February 12, 1996

To: Members of the Executive Board  
From: The Acting Secretary  
Subject: Bank Soundness and Macroeconomic Policy

Attached for consideration by the Executive Directors is a paper on bank soundness and macroeconomic policy, which is tentatively scheduled for discussion on Monday, March 11, 1996. Issues for discussion appear on pages 30 and 31.

Mr. Lindgren (ext. 37151) is available to answer technical or factual questions relating to this paper prior to the Board discussion.

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INTERNATIONAL MONETARY FUND

Bank Soundness and Macroeconomic Policy

Prepared by the Monetary and Exchange Affairs Department  
(In consultation with other Departments)

Approved by Manuel Guitián

February 8, 1996

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## I. Introduction

Since 1980, at least two-thirds of Fund member countries have experienced significant banking sector problems. <sup>1/</sup> Developing and industrial market economies alike have been affected--as have all economies in transition. Their experiences have demonstrated that chronic weaknesses and crises in banking can have significant costs. They have highlighted the importance of a sound banking sector for macroeconomic stability and the efficient conduct of stabilization policies. They also have underscored the influence of macroeconomic and structural policies on the soundness of the banking system.

Fund policy has long recognized that an appropriate macroeconomic policy stance must be supported by adequate microeconomic or structural conditions in the exchange, fiscal, and other policy domains. But the condition of the financial sector had elicited little attention at the macroeconomic policy level until recently. <sup>2/</sup> In both of its 1995 communiqués, the Interim Committee stressed the need for Fund surveillance activities to pay attention to the soundness of financial sectors. This paper responds to these requests by examining how soundness of the banking system is related to macroeconomic and structural policies; and suggesting ways in which a strengthened focus on bank soundness issues can be incorporated into Fund surveillance, the design of Fund-supported programs, and Fund technical assistance.

### 1. Why banks warrant special attention

The focus of this paper will be on banks, although many of the issues discussed apply to the financial system as a whole. The defining characteristics of banks--regardless of legal definitions in particular countries--are that they issue liquid, nominally valued liabilities and that they mainly acquire assets that are illiquid and relatively difficult to value. <sup>3/</sup>

A sound banking system is important because of the key roles it is expected to play in the economy: intermediation, maturity transformation, facilitating payments flows, credit allocation, and maintenance of financial discipline among borrowers. Banks provide important positive externalities as gatherers of savings, allocators of resources, and providers of liquidity and payments services. In transition and developing economies with less well developed financial markets, banks typically are the only institutions producing the information necessary for intermediation, providing the portfolio diversification necessary for maturity transformation and risk reduction, and helping monitor corporate governance. However, even in economies with highly developed financial markets, banks remain at the

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<sup>1/</sup> See Appendix I of Supplement 1 to this paper.

<sup>2/</sup> See Guitián (1993).

<sup>3/</sup> See Diamond and Dybvig (1983), Fama (1985), and James (1987).

center of economic and financial activity, and stand apart from other institutions as primary providers of payments services and as a fulcrum for monetary policy implementation.

Because of the central role a banking system plays in the economy, virtually no government will permit widespread bank failures, or forbear from intervening to support depositors in the event of systemic bank insolvencies. Such public involvement has political as well as economic determinants, reflecting, besides the central role of banks, market failures that arise from information problems in monitoring bank assets and externalities that arise from potential systemic repercussions of individual bank problems.

This difference in treatment of banks compared to other types of enterprises--typically reflected in lender-of-last-resort accommodation of banks, and explicit and implicit guarantees of bank liabilities by governments--has implications for the design of macroeconomic and prudential policies. The impact of macroeconomic policies on the condition of the banking system requires special attention for two reasons: first, a well-functioning banking system is important for the effectiveness of macroeconomic policies, and second, weaknesses that emerge in the banking system, if left unattended, could pose a threat to macroeconomic stability.

Public policy concerns with banking soundness should be focused on the banking system as a whole, rather than on individual banks. Only when the deterioration of a particular bank has systemic implications due to possible contagion or domino effects, or when the bank represents a large portion of the banking system, would the consequent damage to the system as a whole warrant public policy attention. Prevention of stress in a banking system requires well balanced institutional and regulatory structures, as well as a macroeconomic policy mix that is sensitive to banks' financial soundness.

## 2. Overview of the paper

The next chapter begins with the definition and measurement of banking system soundness and concludes by explaining how the incentives of unsound banks are distorted, and how these distortions affect the operations of the banking system and its responses to policy action. Chapter III highlights the issues posed by current or potential banking system unsoundness in four policy areas: the design and implementation of stabilization programs, the use of monetary instruments, the implications for fiscal policy, and the management of international capital flows. Chapter IV outlines key structural policy issues relevant to maintaining a sound banking system. Chapter V examines how the Fund might better incorporate banking sector considerations into its surveillance, program design, and technical assistance work; it also discusses the implications of such a role in relation to other international agencies and the use of staff resources. Chapter VI concludes by suggesting several issues for Board discussion.

Two supplements accompany this paper. The first, "Macroeconomic Consequences and Causes of Bank Unsoundness," analyzes the two-way linkage between banking system unsoundness and macroeconomic policy. The second supplement, "Maintaining a Sound Banking System," discusses the elements of a structural framework that can support sound banking. These elements comprise an appropriate institutional environment, and a network of control structures, including internal governance, market discipline, and official regulation and supervision.

This paper and its supplements are part of a broader ongoing effort to explore the macroeconomic implications of banking and financial sector issues. In particular, they do not cover issues such as policy responses to banking crises, nor resolution or restructuring strategies, which will be subjects of forthcoming reports.

## II. Aspects of Banking System Soundness

### 1. Defining a sound banking system

For purposes of this paper, a sound banking system is defined as one in which most banks (those accounting for most of the system's assets and liabilities) are solvent and are likely to remain solvent. Solvency is reflected in the positive net worth of a bank, as measured by the difference between the assets and liabilities (excluding capital and reserves) in its balance sheet. 1/ The likelihood of remaining solvent will depend, inter alia, on banks' being profitable, well-managed, and sufficiently well-capitalized to withstand adverse events. In a dynamic and competitive market economy, efficiency and profitability are linked, and their interaction will indicate the prospects for future solvency. Inefficient banks will make losses and eventually will become insolvent and illiquid. 2/ Undercapitalized banks, that is, those with low net worth, will be fragile in the sense of being more prone to collapse when faced with a destabilizing shock such as major policy changes, a sharp asset price adjustment, financial sector liberalization, or a natural disaster.

Banking systems may exhibit different degrees of vulnerability over time. They may be functioning poorly, or working relatively well now but give signs (e.g., through low earnings or capitalization) of probable future

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1/ Thus, net worth is equivalent to capital plus reserves.

2/ Although problems may first become public through illiquidity, insolvency normally precedes illiquidity. Banks can conceal losses and fund them by attracting new deposits or other liabilities. When problems become severe enough, which is usually well after insolvency, net sources of funds turn negative and illiquidity results.

problems or potential crisis. 1/ There is no benchmark measure of systemic insolvency which determines when a banking system can be classified as unsound or when a crisis will occur. However, the difficulty of precisely classifying a banking system as "sound" or "unsound" does not detract from the usefulness of the concept, proxied by solvency, any more than the difficulty of precisely defining concepts like realistic exchange rates or sustainable balance of payments has barred the application of those useful notions.

## 2. Measuring and predicting unsoundness

Accepting the usefulness of a definition is one thing; practical application from a macroeconomic policy perspective is another. Using current solvency as a proxy for the soundness of a banking system abstracts from important measurement and projection issues.

### a. Measurement: portfolio valuation and aggregation

While solvency is straightforward to define, it is difficult to measure. Bank loans, which represent the bulk of bank assets in most countries, are extremely difficult to value; that is one reason why even in countries with well-developed capital markets bank loans are not readily traded or securitized. 2/ From an economic standpoint, insolvency results when the present value of the expected stream of future net cash flows becomes negative. There is always an element of judgment in projecting and valuing uncertain future payments. In addition, owners and managers of unsound banks have incentives to accrue unearned income and show loans as performing in order not to lose their bank. Thus, balance sheet figures on asset value and on nonperforming loans may not adequately represent a bank's actual circumstances. Any assessment of insolvency is further complicated by off-balance-sheet items and problems of consolidating the balance sheets of bank subsidiaries and other related financial units.

These weaknesses in information explain why banking problems emerge with little apparent warning even in the most advanced countries. Even the combined resources of external auditors, credit rating agencies, stock market analysts and supervisors may not spot banking problems in time.

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1/ Sundararajan and Baliño (1991, p. 3) define a financial crisis as, "a situation in which a significant group of financial institutions have liabilities exceeding the market value of their assets, leading to runs and other portfolio shifts, collapse of some financial firms, and government intervention."

2/ Valuation is discussed further in Appendix I of Supplement 2 to this paper.

Solvency can be aggregated across banks; clearly a banking system in which a large portion of banks is insolvent at current valuation would be unsound. However, aggregation across banks may mask problems. For example, a key payments center bank that is slightly insolvent might have more significant systemic implications than a thoroughly insolvent savings bank.

b. Prediction

Apart from the difficulties in measuring current solvency, there is the additional complexity that the concept of soundness of a banking system should encompass its dynamic development and its susceptibility to shocks. Solvency is essentially a static concept: it characterizes a bank (or a banking system) at a point in time. A forward-looking measure of banking system health should capture the determinants of bank insolvency, which include poor asset quality and earnings as well as less quantifiable factors such as management weaknesses, failures of internal and external control, and the potential impact of exogenous events.

To predict future problems of individual banks, early warning indicators seeking to capture those weaknesses from bank financial data are used by supervisory authorities in many countries. 1/ Bank-reported data are often used in conjunction with complementary statistics from other sources and qualitative indicators, many of which are based on supervisory inspections. To the extent that bank data are inaccurate, the quality of such indicators and models is impaired. Even in such circumstances, though, the data may contain significant information: for example, an increase in loans past due provides a warning, even if such loans are systematically underestimated. Thus, specific indicators and trends derived from bank statistics, along with complementary data and judgment, can help to predict bank unsoundness.

c. Systemic approaches

Most early warning models require access to bank-specific data; however, there is potential to measure or project systemic banking problems from aggregate economic data as well. For example, if an economy or certain important sectors are in a prolonged recession, there is cause for concern about the soundness of the banking system. Excessive credit growth relative to GDP and rapid rises in asset prices are often indicators that the quality of bank portfolios is weakening and risk exposure is increasing. 2/ In some cases, data on market prices of bank shares also can be of value in assessing bank fragility. 3/

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1/ See Appendix I for details on this subject.

2/ See, for example, Hausmann and Gavin (1995).

3/ See Clare (1995) and Fischer and Gueyie (1995).

An appropriate set of early warning signals will vary across countries, depending on the quality and availability of banking and macroeconomic data, and the specific institutional setting. Additional empirical work involving qualitative as well as quantitative indicators is required to define the characteristics likely to measure and predict insolvency at the level of individual banks, and of banking systems.

### 3. The behavior of unsound banks

Banks fail, and banking systems become unsound, for a variety of reasons, including poor or negligent management, excessive risk-taking, a poor operating environment, fraud, or a sharp deterioration in the economic environment that invalidates the assumptions on which loans and investments were initially made. In analyzing the policy implications of bank unsoundness, it is important to bear in mind that some of the behavioral patterns observed in unsound banks affect the banking system's interactions with and responses to policy instruments. Banks that have lost most or all of their capital face a different incentive structure from sound banks, and competition from insolvent banks can pose threats to the financial soundness of their competitors. As owners and managers try to recoup their losses, moral hazard increases, particularly when managers or owners do not have their own funds at stake. 1/ An unsound bank may offer higher interest rates than competitors to draw in deposits to pay operating expenses, may resort to outright gambling by choosing high risk transactions, or may incur higher risk through adverse selection. 2/ In many cases, unsound banks become captive to insolvent debtors or carry a portfolio of loans to related borrowers, who have no intent to repay their debts. Unable to declare loans in default lest they acknowledge their own insolvency, such banks may continue to lend to nonperforming borrowers or to capitalize interest on these borrowers' loans.

Thus, banks that are desperate to raise income or that have become overburdened with nonperforming assets may spiral into insolvency with increasing speed. 3/ As an unsound bank searches for liquidity at any cost or is willing to assume any risk, it will tend to be less responsive to interest rates and other market signals, or may exhibit perverse responses. 4/ Such behavior, when sufficiently widespread, has important implications for the responses of economic agents, the functioning of

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1/ Moral hazard is the tendency for people to be less careful when they do not expect to bear the cost of their behavior.

2/ In order to raise profitability, a bank would be inclined to charge higher interest rates to borrowers. Adverse selection occurs if it fails to adequately screen customers, and attracts and selects only those customers looking to fund high risk projects.

3/ This highlights the importance of strong exit policies, as discussed below.

4/ The impact of these behavioral factors on the operation of various monetary policy instruments is outlined in Supplement 1 to this paper.

financial markets, the efficiency of financial resource use, the transmission of monetary policy, and the ultimate resolution costs. The degree of unsoundness at which these effects take hold will vary from situation to situation; where unsoundness is systemic, the macroeconomic effects are likely to be significant.

### III. Macroeconomic Policies and the Banking System

Promotion of a sound banking system represents a legitimate policy objective--as well as a constraint--in the design of stabilization policies and structural reforms. This is because weaknesses in the banking system can constrain the effectiveness of macroeconomic measures in general and of monetary policy in particular. Hence the rationale for designing macroeconomic policies and the policy mix so as to maintain a sound banking system, and for implementing structural policies underpinning the soundness of the banking system as a complement to macroeconomic policies. <sup>1/</sup> There is also a need to determine the severity of any banking problems in order to adapt the objectives and instruments of macroeconomic policies so as to prevent the system from deteriorating further, and facilitate its strengthening. This chapter discusses key areas in which there are linkages between macroeconomic policies and banking system soundness that may require adaptation of objectives or instruments. These areas are: overall macroeconomic policy formulation in the context of stabilization policies, the choice of monetary instruments, the fiscal balance, and dealing with foreign capital flows.

#### 1. Stabilization policies

While stabilization generally has a positive impact on the economy as a whole as well as on the banking system, it can also pose transitional problems. Concern for the soundness of the banking system can bring to the surface trade-offs in the choice of policy objectives and program targets, and influence the pace with which such objectives can be pursued. Typically, inflation and balance of payments targets are pursued with monetary, exchange rate and fiscal policies. In choosing the mix of these policies, their implications for the soundness of the banking system should be considered along with the influence of the banking system on policy flexibility.

It is clear that the effect of banking system soundness on policy flexibility would vary depending upon the specific structure of banks' balance sheets and other initial conditions. Restrictive monetary policy measures that cause high interest rates or large exchange rate adjustments may cause major distress for banks and bank customers exposed to market

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<sup>1/</sup> The two-way linkages between macroeconomic policy and banking system soundness are discussed in more detail in Supplement 1 to this paper.

risks, and this could trigger systemic problems. Thus, the soundness of the banking system could constrain the use of monetary and exchange rate policies to achieve program objectives.

The most extreme case is when a banking system has already deteriorated to the point where a financial crisis is imminent or in process. The experience in most countries is that when this situation is faced, short-term stabilization objectives give way to aims related to preventing or dealing with the crisis. The prospect of a crisis--which could take the form of a run on banks or a general collapse of financial institutions--tends to subordinate most other policy considerations, including those in the monetary and fiscal domains. This argues for realistic pre-crisis assessments of weak banking systems, of the trade-offs in each individual situation, and of the probability of crisis. This should lead to an orderly bank restructuring program that is well integrated with macroeconomic and prudential policies.

The constraint of an unsound banking system must be considered when formulating the targets and phasing of any macroeconomic program; otherwise, early policy gains could be eroded through bank losses or swept away in a banking crisis. There may, therefore, be a need to adjust the objectives or the phasing of a macroeconomic program to support other structural reforms in order to restore soundness to the banking system and flexibility to policy making. This may require an allocation of resources, including human resources, to facilitate the structural reforms. Needless to say, concern with banking system unsoundness cannot be seen as an excuse for postponing adjustment, but rather should lead to a sustainable pace of adjustment, and to an appropriately designed adjustment program that combines macroeconomic and structural policies.

For example, a sharp decline in inflation, while beneficial over the medium term, may have negative effects for the banking system in the short term. Banks earning their income from inflation-driven activities need time to refocus their business toward traditional banking in a low inflation environment. Bank clients could be exposed to large relative price adjustments and rising real interest rates. An inflation target, therefore, may need to be tempered by concerns that a faster reduction in inflation might have an adverse impact on the banking system in the short term, as was the case recently in Mexico. <sup>1/</sup> Programs of sharp disinflation would therefore require particular attention to banking soundness issues.

At all times, monetary policy will be constrained by what the banking system can be counted on to accomplish, which is largely dependent on how sensitive banks are to interest rate signals and the extent to which the banking system and the central bank itself are able to control their own balance sheets. For example, attainment of a targeted accumulation of

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<sup>1/</sup> See "Mexico - Third Review Under the Stand-By Arrangement" (EBS/95/210, 12/6/95), p. 8.

international reserves may be sought through restraint in domestic credit expansion or through a combination of credit policy and an exchange rate adjustment. An unsound banking system saddled with a large share of nonperforming loans may not be able to reduce aggregate credit flows to the extent required by the first course of action. Alternatively, a devaluation can bring a different set of problems, if banks or their customers have significant foreign exchange exposures.

Major changes in the exchange rate can seriously damage a banking system, as can prolonged over- or undervaluation of an exchange rate-- although in these situations there are always gainers as well as losers. At the same time, the limitations imposed by a weak banking system on the use of interest rate policy will limit the scope for exchange rate management through domestic interest rates--regardless of exchange rate regime. In particular, an unsound banking system may limit the scope for sustaining a currency board arrangement. <sup>1/</sup>

Insofar as monetary and exchange rate policies are constrained in their effects by weaknesses in the banking sector, an additional fiscal effort may become necessary to reduce resource pressures in the economy. There may be very limited room for such compensatory tightening, however, when public finances are weak and the government already is being called upon to honor various deposit and loan guarantees. This situation would typically call for a well considered phasing of the necessary fiscal adjustment to support bank restructuring, in parallel with other structural policies.

## 2. Monetary instruments

With a fragile banking system, there is not only a need to carefully evaluate the feasibility and implications of the overall macroeconomic targets and policy mix, but also of the instruments with which these policies will be pursued. This is particularly important in the monetary area.

### a. Use of indirect instruments

The effectiveness of indirect instruments of monetary control is constrained when weaknesses in banks' loan portfolios or management lead to interbank market segmentation and make banks unresponsive to price signals. Market segmentation is typically reflected in sound banks receiving more deposits than they can lend, and in their quest for safe and liquid assets cutting their interbank exposures and becoming the principal holders of safe instruments like treasury bills, the yields of which tend to decline. At the same time, because unsound banks may not have access to the interbank

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<sup>1/</sup> The limitations posed by an unsound financial sector on the classical interest rate defence of an exchange rate and the functioning of a currency board are discussed in Folkerts-Landau, Ito, et al. (1995, Chapter VII).

market, there may be frequent shortfalls in their required reserves, overdrafts in their clearing accounts at the central bank, and distress borrowing. This situation would distort interest rates and complicate the use of market-based instruments. With unsound banks, certain safeguards may be required in the operation of central bank credit facilities; for example, by limiting participation of weak banks in central bank credit auctions. <sup>1/</sup>

Under circumstances of extreme market segmentation, indirect instruments may lose their effectiveness altogether and direct instruments of monetary policy may be required for short-term control. This would be the case, for example, where interbank markets are not functioning and the central bank has to redistribute bank liquidity. Under such circumstances, bank-by-bank credit ceilings could be useful for credit management on a temporary basis, as could interest rate ceilings to limit distress borrowing. In fact, the use of such instruments could well weaken banks' profitability and constrain their liquidity management and thus further deepen their financial difficulties. In cases of management intransigence or other extreme circumstances, the only way to establish monetary control over weak banks might be through supervisory intervention, which would imply official administration of problem banks.

Many developing and transition countries are seeking to develop their money markets and shift monetary intervention to market-based instruments. Problems in the banking system may influence the pace of these reforms, as was observed in a number of countries in the 1980s; for example, Argentina, Chile, and the Philippines temporarily reintroduced interest rates controls to alleviate the burden of high real interest rates on borrowers and banks. <sup>2/</sup> The appropriate instrument mix and the phasing of any new instruments will depend on the general state of development of a country's banking system and broader financial markets, the degree of unsoundness in the system, and the scope for fiscal, prudential, and other structural measures to strengthen bank soundness.

#### b. Lender-of-last-resort facilities

Considerations of bank solvency become highly relevant in managing central bank lender-of-last-resort (LOLR) facilities and related payments system policies. Most central banks provide some form of credit facility, such as a Lombard facility or discount window, which can be used in order to provide liquidity and facilitate payments settlement for banks in distress. Central bank last-resort lending will generally take the form of liquidity injections directed to a particular bank or set of banks, and may need to be sterilized by reducing liquidity elsewhere, for example, through open market operations or other instruments.

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<sup>1/</sup> See Saal and Zamalloa (1995).

<sup>2/</sup> See Alexander, et al. (1995, p. 21).

The intent of central bank LOLR facilities is not to provide resources to insolvent institutions, but to provide temporary liquidity to sound institutions, typically at a penalty rate. In order to manage its LOLR facility, the central bank must know (on the basis of information from supervisors) which banks are approaching insolvency or are insolvent. In practice, however, both central banks and supervisors often have difficulty distinguishing illiquid but solvent banks from insolvent ones. <sup>1/</sup> This is even more difficult when most banks or the entire system is in distress. Experience shows that banks that have major or protracted liquidity problems invariably also are insolvent.

In exceptional cases, the central bank may be called upon to lend to insolvent banks, for example, to buy time for the design of restructuring strategies in cases where banks are viewed as "too-big to fail" or when the lending is part of a systemic restructuring strategy. In all such cases, central bank credit (which essentially provides insolvent banks with equity as well as liquidity) must be fully guaranteed by the government. In the case of central bank lending to insolvent banks, the use of collateral is largely illusory from the public sector's point of view, in the sense that central bank claims crowd out other creditors in the final liquidation of a bank and saddle them with the bank's growing negative net worth, which the government often ends up absorbing in part or in full. <sup>2/</sup> These considerations suggest that LOLR facilities must be managed with utmost caution, relying on careful monitoring of banking soundness.

### 3. Fiscal balance

The fact that resolving banking system unsoundness often involves substantial government expenditure means that the fiscal balance becomes a constraint on the type of corrective action that can be taken. Banking system problems are often known but neglected, and supervisors often are prevented from intervening in banks because this would bring the problems out in the open and "cause" government expenditure. Typical justifications for inaction are that there is "no room in the budget" or that the fiscal situation is "too weak" to allow for any consideration of banking problems.

The reasons for a lack of early action are often political, and the opacity of banking problems makes it relatively easy to delay them for a subsequent government to deal with. But from an economic point of view such delays are costly; experience has shown that the longer a solution is delayed, the more difficult the ultimate resolution becomes; as banks may spiral deeper into insolvency. Furthermore, the longer insolvent banks are

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<sup>1/</sup> For example, a 1991 study of Federal Reserve LOLR "extended credit" to banks showed that 90 percent of those banks subsequently failed (see U.S. House of Representatives, 1991, p. 94).

<sup>2/</sup> Nevertheless, encouraging adequate collateralization--for example, through short-term repurchase agreements--can help to restore the functioning of the interbank market.

allowed to continue operations, the more implicated and obligated the authorities become, which makes it more likely that the ultimate resolution will involve fiscal expenditure on a substantial scale.

It is essential for efficient resource allocation that banking system problems not be "swept under the rug" in fiscal policy formulation. The government's full costs, including contingency costs, need to be taken into consideration in a transparent way. All government current obligations to banks, including the servicing of any securities for bank capitalization or restructuring, should be brought into the budget. Contingent liabilities (such as loan and deposit guarantees, and any negative net worth of the central bank or state-owned banks) should be estimated as well as possible. <sup>1/</sup> The extent and form in which such contingencies should be included in the budget needs to be considered in each case. If such contingencies are transparent to the public, it would be recognized that the fiscal liabilities have already been incurred, and, therefore, there will be more pressure for timely action to deal with the problem, ultimately reducing fiscal costs.

On the revenue side, tax policies can also be used to provide transparency and keep banks sound. In order to prevent tax payments on fictitious profits that would cause gradual decapitalization of banks, it is desirable that loan loss provisions be fully tax deductible and that interest accrued on nonperforming loans not be recognized as income.

The impact of a weak banking sector on fiscal balance should be evaluated after projecting the actual and contingency costs of supporting the banking system both for the short and medium term. In addition, current and prospective expenditures resulting from bank restructuring strategies and loan recovery arrangements should be considered. Special tax breaks for banks to allow their rehabilitation should be discouraged; it is better to show such transfers openly. Similarly, any support for weak banks through loans or deposits from state-controlled entities should be part of a comprehensive bank restructuring strategy and not be used merely to keep banks liquid, which would only serve to increase ultimate government resolution costs.

#### 4. Foreign capital flows

Banks facilitate international capital movements and contribute to the integration of international financial markets. Given the central role of the banking system in all countries, the perceived soundness of a banking

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<sup>1/</sup> In the recent Board discussion of quasi-fiscal activities of public financial institutions, the importance of transparency was emphasized, and directors noted the importance of contingent liabilities, and of drawing attention to the existence of such liabilities, even if quantification is difficult (BUFF/95/42, 5/24/95). See also "Quasi-Fiscal Operations of Public Financial Institutions" (SM/95/65, 4/5/95).

system will affect capital flows. A sound banking system has greater access to foreign interbank and capital markets and could induce repatriation of capital. If the system is allowed to fall into distress, capital flight can be triggered and bank access to interbank and other foreign capital markets can be constrained; such a loss of access could in turn trigger a systemic crisis.

In recent years, as a result of freer capital movements and increased financial market integration internationally, the management of large capital flows, and especially of swings in such flows, has become a challenge for macroeconomic policy makers and bank supervisors in many countries. The dual relationship between macroeconomic policies and banking system weaknesses has become more transparent with the internationalization of the financial system. In particular, banks now face greater exposure to credit and market risk--including off-balance-sheet risks--on account of their participation in international financial markets. Banking system soundness objectives therefore should be added to the well known policy dilemma of how to balance monetary, exchange rate and fiscal policy objectives in the context of an open capital account. 1/

The impact of capital flows and their reversals on a banking system are in some ways similar to the impact of cyclical movements in the domestic economy. A rapid credit expansion and asset price inflation can be of domestic or external origin. In the case of capital inflows and the resulting rapid growth of liquidity in the banking system--unless the liquidity is appropriately sterilized--there is pressure for bank credit to grow rapidly. Experience has shown that the quality of credit tends to suffer when credit grows too quickly. This becomes particularly worrisome when there are known weaknesses in the banking system, including problems in banks' credit appraisal and internal control procedures, poor compliance with prudential rules, poor loan valuation practices, or weak capitalization. In the case of capital outflows, banking system liquidity would tighten and--unless expanded by monetary (re)injection of liquidity--banks would be forced to call in credits. This process would expose underlying weaknesses in bank loan portfolios, which if widespread could also result in a systemic crisis.

The design of prudential as well as macroeconomic policies, therefore, should consider the banking system's capacity to effectively intermediate capital flows. This will be particularly important in the context of capital account liberalization, which may radically change banks' operating environment. Prudential measures should seek to foster a strengthening of credit and other risk management capabilities in banks, supported by strictly enforced capital adequacy and other prudential regulations. Banks

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1/ In reviewing experiences with capital account convertibility, Directors "emphasized that the existence of an adequately strong and well-supervised financial system...was essential for the nondisruptive removal of capital controls" (BUFF/95/83, 8/4/95, p. 1).

not in compliance with prudential regulations should be barred from entering into new activities, accepting new liabilities or extending certain credits. A tightening of prudential policies also could have a direct effect on the capital flows, by leading banks to reduce deposit rates insofar as banks become restrained in accepting new liabilities and granting new credits.

If a banking system is known to be weak and prudential policies are known to be ineffective or seriously deficient in controlling banks' risk exposures, there is an argument in favor of including in the management of monetary policy the aim of preventing excessive credit expansion or contraction in order to contain the possible adverse effects on asset quality and banking system soundness of swings in capital flows. These soundness considerations could influence the mix of exchange rate and interest rate adjustments in response to capital flows, and thereby affect the choice of specific operating targets and policy instruments.

#### IV. Structural Policies and the Banking System

Structural policies can have a critical impact on the soundness of the banking system. This chapter focuses on the need for independent supervision as part of the oversight framework, the nature of key prudential policies, the importance of exit policies, and the implications of financial sector liberalization.

##### 1. Supervisory authority and independence

Primary responsibility for the oversight of banks lies with their owners and managers; there is no substitute for adequate internal governance. External forces provide additional discipline through financial markets, forcing the exit of poor owners and managers or of the entire bank. However, there are limits to the efficacy of market forces, particularly in developing and transition economies where financial market participants are ill-equipped to monitor banks and where the alternatives to domestic banks for payments, savings or finance are limited or non-existent. Discipline in the form of official supervisory oversight is critical to compensate for failures in internal governance and market discipline. <sup>1/</sup>

In order to function properly, the supervisory agency must have sufficient capacity, authority, and independence. Supervision covers a range of activities, and requires adequate human and financial resources. The supervisory agency must have the capacity to provide inputs into legislation, design regulations, evaluate owners and business plans of banks applying for licenses, assess existing banks' net worth and loan valuation procedures, and analyze the management functions and internal controls of

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<sup>1/</sup> Supplement 2 to this paper discusses the interactions between internal governance, market discipline, and official oversight in more detail.

banks. To accomplish these and related tasks, the supervisory agency must be able to attract and retain high caliber employees, and to provide them with the necessary facilities, equipment and training.

Beyond this basic capacity, the supervisory agency must have sufficient authority, established by law, to carry out its duties. Necessary powers include the authority to request data from banks, to conduct on-site examinations at the supervisor's discretion, and to enforce corrective actions ranging from informal agreements, to cease-and-desist orders, to closure. Supervisors must be able to act against banks without the delays and subversions which result from a need for political approval; their authority to this end must be firmly established, along with legal protection for supervisors who are properly discharging their duties.

The efficiency and integrity of the oversight process is hampered when the supervisory agency is not independent. Supervisory actions are often unpopular. The supervisory agency should be institutionally structured to have sufficient independence to carry out its day-to-day operations without interference. In many countries, this also means that the supervisory agency should have its own source of income so that it cannot be held hostage to politically motivated budget battles. 1/ In order to ensure institutional independence, provide adequate information flows between the supervisory agency and the LOLR (the need for which was noted above), and assure proper consideration of banking system soundness objectives in the broader policy mix, the supervisory agency is most commonly located within the central bank. Alternative arrangements that constitute the supervisory agency as a separate administrative unit of government can also be appropriate. It should be noted, though, that supervisory agencies subordinated to a government ministry tend to lose their independence, particularly when the government stands to bear the costs of bank closures or other supervisory actions.

The concept of supervisory independence should encompass prudential regulations, the application of which should be independent of monetary management. Prudential regulations are not monetary instruments to be varied over the business cycle in an effort to control domestic liquidity or to promote recovery from a general or sectoral economic slowdown. The use of prudential regulations in that way could result in conflicts between supervisory and monetary authorities, reduce the long-term safety of the banking system, and create the mistaken impression that flexibility in the compliance with prudential regulations is acceptable. Rather, minimum regulatory standards should be established so as to keep banks sound regardless of the phase of the business cycle. 2/

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1/ Such income can come from levies on banks being supervised.

2/ The initial implementation of prudential regulations may have short-term macroeconomic effects; the need for phasing in such regulations is discussed in Appendix II.

If, due to a decline in general economic conditions, a particular bank has difficulty complying with regulatory standards, the authorities may deem it appropriate to agree on a compliance program with that bank, as a means to closely supervise its operations and monitor its progress toward meeting the regulatory standards; this need not imply a generalized relaxation of such standards. On the other hand, in periods of rapid growth in bank assets, increased monitoring of lending to high-risk sectors is in order. This may result in calls to stabilize or reduce exposure to such sectors, or in stricter collateralization rules. Such a tightening of prudential oversight is fully consistent with the supervisor's responsibility to take an overall view of banking sector developments and to act to maintain soundness when necessary.

## 2. Key prudential policies

Risk is inherent in banking. Prudential policies can attempt to limit risk, and to make sure that it is managed properly. Policies restricting insider lending, monitoring foreign exchange exposure, or averting maturity mismatch help to limit credit, exchange rate, and interest rate risk. 1/ The most important initiative to control credit risk in recent years has been the widespread implementation of minimum capital adequacy standards.

The distance between soundness and insolvency can be measured in terms of capitalization. In 1988, the Basle Committee on Banking Supervision (Basle Committee) 2/ agreed to require large internationally active banks to hold capital equal to at least 8 percent of risk-weighted assets, thus preventing banks from unduly increasing credit risk through greater leverage. Many non-G-10 countries have adopted the Basle standard as well. In implementing capital standards, the parallel implementation of appropriate loan valuation and classification practices and supporting accounting standards become critical. Without such practices, the measurement of capital may be inadequate and nominal adherence to a capital adequacy standard may be misleading. 3/

The owners and managers of each bank remain responsible for maintaining adequate capital and reserves and structuring the bank's portfolio so as to be sufficiently resilient to withstand the adverse shocks inherent in the banking business. Well-managed international banks hold capital substantially in excess of the 8 percent minimum. 4/ Comparable

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1/ Supervisory instruments are discussed further in Appendix III of Supplement 2 to this paper.

2/ The Basle Committee members represent the central banks of G-10 countries as well as Luxembourg and Switzerland. The Committee works under the auspices of, but is distinct from, the Bank for International Settlements (BIS).

3/ See Dziobek, Frécaut and Nieto (1995) and Kane (1995).

4/ See *Institutional Investor* (August 1995).

resilience in countries where economic volatility is higher than in G-10 countries would require capital considerably higher than 8 percent of risk-weighted assets.

In late 1995, the Basle Committee introduced an amendment to its 1988 capital accord, recommending that banks be required to hold additional capital according to their exposure to market risk. <sup>1/</sup> This amendment acknowledges that financial innovation has made it increasingly easy for banks to radically alter their risk profiles with a few transactions and that new approaches were needed for the official oversight of risk management.

While many initiatives have been put in place to measure and limit specific forms of risk, there has been a parallel effort to adopt a more comprehensive approach to risk management, stressing the importance of internal governance and the role of market discipline. The role of prudential policy in supporting the first of these is to ensure that banks institute appropriate internal control procedures, and that managers are knowledgeable about and involved in the risk assessment process. Prudential policy can also support market discipline, by fostering enhanced public disclosure of bank financial information. With a view to developing improvements in this area, the Basle Committee recently has issued recommendations regarding public disclosure of banks' trading and derivatives activities.

### 3. Exit policies

The exit of weak individual banks is critical for the maintenance of a strong banking system. The prolonged operation of unsound banks permits them to spiral into deeper insolvency, and possibly to damage competitors through market practices which, although not viable in the long term, might enable short-term survival. Experience has shown that unsound banks are always in worse condition than their financial statements indicate and that the least intrusive and cheapest way of keeping a banking system sound is to force the early exit of nonviable banks. <sup>2/</sup> Exit can be forced by market forces or by supervisory action.

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<sup>1/</sup> Market risk may be measured using either a standard approach or banks' own risk assessment models.

<sup>2/</sup> In 1991, the United States introduced legislation (FDIC Improvement Act) that required supervisors to take prompt corrective action once a bank reaches certain levels of under-capitalization. Fund technical assistance advice has commonly included recommendations on special legal procedures for the conservatorship, restructuring and liquidation of banks, to be based on administrative summary procedures where the judicial system does not allow a speedy or impartial response.

Competition and the market for corporate control can remove inefficient or unprofitable banks well before they become insolvent. Thus an open and competitive banking market exerts its own form of discipline. Market discipline exerted by large depositors, particularly in the interbank market, typically will come into play in an active sense only after there are concerns over solvency. A liquidity shortage due to segregation in the interbank market, or a run by depositors, may force the disorderly failure of a bank, with potentially dangerous repercussions. A fire sale of assets may further decrease the bank's net worth. The sequential servicing of deposit withdrawals may impose a socially inefficient distribution of losses and could result in a domino effect if other banks remain exposed. Finally, depositors may not be able to distinguish problems in an individual bank from systemic conditions, resulting in a crisis of confidence and widespread runs.

Thus it is particularly important for supervisory action to be taken to initiate or at least control closure. Closure should certainly occur when a bank becomes insolvent; preferably it would occur earlier, when the bank becomes seriously undercapitalized. Supervisory data often provide the basis for such action. If closure has been initiated by market forces, supervisors should be prepared to oversee and smooth the process.

A system of limited deposit insurance can assist the authorities in maintaining some stability and in disposing of insolvent banks. Such a system protects small depositors, promotes consolidation of creditors by replacing dispersed depositors with the insurance fund as the principal creditor, and can provide political cover for closure decisions. However, where it has not been properly designed to combat the risks of adverse selection and moral hazard attendant on the guarantee, deposit insurance can diminish market discipline and foster incentives for poor internal governance. In particular, deposit insurance that provides excessive coverage can increase resolution costs and harm competitors by creating opportunities for owners and managers to continue to operate a troubled bank that would otherwise be closed by market discipline. <sup>1/</sup> Similarly, excessive LOLR credit can contribute to delays in remedial actions. Therefore, deposit insurance that is limited in coverage (to encourage market discipline while protecting small depositors), together with a well-operated lender of last resort (to provide liquidity to solvent banks and discourage runs by uninsured depositors) and strong prudential supervision that ensures timely and orderly restructuring or exit of weak banks, can contribute to a stable and sound banking system.

The desirability of prompt action to enforce corrective measures or initiate the conservatorship, restructuring or liquidation of troubled banks on strictly technical grounds without political interference reinforces the need for adequate supervisory capacity, authority, and independence

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<sup>1/</sup> Issues in the design of deposit insurance are discussed in Appendix II of Supplement 2 to this paper.

discussed above. Orderly bank failures should be viewed as powerful reminders to other banks that the market system works and that they need to remain sound. Strong exit policies, including intervention before a bank is formally insolvent, will require a change in attitude in many countries. Often the authorities consider bank failures to be evidence of a political or supervisory failure, and go to considerable lengths to avoid closure. For example, banks are sometimes declared to be "too big to fail" because it is considered that closing them would carry "systemic" risks. Although this is occasionally a valid consideration, too often it serves as a convenient excuse to postpone needed actions. Policies which foster an open and competitive banking market can help to create a banking system in which no single bank is too big to fail.

#### 4. Financial sector liberalization

In recent years, many countries have implemented programs of financial sector liberalization, often as part of a broader program of stabilization and economic opening. Deregulation permits banks to enter into new and unfamiliar areas of business, where they may incur increased exposure to credit, foreign exchange, and interest rate risk. For example, formerly regulated banks may lack the necessary credit evaluation skills to use newly available resources effectively; rising asset prices may be relied upon for repayment, rather than projected cash flows. Deregulation often opens the domestic banking market to other financial institutions and to foreign competition; this will put pressure on the market share and profitability of domestic banks, at least in the short term.

Unless properly overseen, liberalization can result in too rapid growth of bank assets, over-indebtedness, and asset price bubbles. Market participants and supervisors, as well as banks, face challenges in managing the liberalization and adjusting to the new environment. Since radical changes in banks' operating environment can be expected to increase banking risks and affect banking soundness, liberalization should be accompanied by prior or concurrent measures to strengthen the oversight framework. Although there is no direct connection between financial liberalization and financial crises, many banking systems have experienced significant problems following liberalization, particularly where adequate internal controls had not been developed and prudential regulation and supervision failed to contain the increased risk of new or expanded activities. <sup>1/</sup> As a result, it is now well recognized that, in addition to adequate stabilization

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<sup>1/</sup> For example, Argentina (early 1980s), Finland, Thailand, and Venezuela. See Sundararajan and Baliño (1991), Johnston and Pazarbaşıoğlu (1995) and Fischer and Gueyie (1995).

policies, a timely implementation of prudential and bank restructuring policies is essential to avoid major disruptions to growth and stability in the course of financial liberalization. 1/

This, however, raises the question of how best to design and implement prudential regulations and supervisory systems in order to ensure a successful liberalization of financial markets and transition to market-based instruments of monetary control. Insofar as the initial condition of the banking system is marked by significant portfolio weaknesses and inadequate capitalization, rapid liberalization of interest rates and a strengthening of prudential norms will be difficult to implement, unless a program of bank restructuring is put in place in parallel with the liberalization package. In practice, policies to restructure banks (and enterprises) and strengthen prudential supervision can be phased in to support the interest rate liberalization process.

Country experiences suggest that the scope of official oversight systems needs to vary with the state of market development and the institutional environment, and to continuously evolve as markets evolve. Appropriate sequencing of prudential and bank restructuring policies can serve to establish a critical mass of reforms in supervision and of bank balance sheets, which in turn would help to speed up the adoption of market-based instruments and enhance their effectiveness. 2/ Operational considerations suggest that reforms of bank accounting standards and loan-valuation systems should begin early in the reform process, as these strengthen supervisors' ability to monitor banks, increase the efficacy of oversight by bank owners, and provide a basis for market discipline. Financial market discipline can be strengthened by improved data disclosure, a careful design of the regulatory framework, and policies regarding deposit guarantees, last resort lending, market entry, and exit that do not inhibit market discipline.

A program of systemic restructuring of banks, where necessary, should be combined with appropriately strong prudential policies--phasing in prudential regulations, bringing about balanced application of off-site analysis, on-site inspection, and external audits--and with policies to establish institutional arrangements for loan recovery and enterprise restructuring. Such a comprehensive package, encompassing both official oversight and restructuring options, is necessary to avoid adverse incentives toward excessive risk-taking by banks. Moreover, reforms of

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1/ During Executive Board Seminar 94/13 on the adoption of indirect instruments of monetary policy, Directors "stressed the importance of concomitant reforms, including the establishment of effective banking supervision" (BUFF/94/113, 12/9/94, p. 2). See also Galbis (1995).

2/ For a detailed discussion of issues in sequencing prudential reforms during financial liberalization, see Sundararajan (1995).

commercial bank accounting systems and implementation of effective internal monitoring systems can support stabilization objectives and facilitate the task of financial restructuring of banks.

Prudential policies to strengthen the banking system should, therefore, be made an integral part of any liberalization program. However, standards should not be set at levels that few banks can meet. The implementation of new or more stringent prudential standards also must be undertaken with due regard to both macroeconomic trends and the strength of the banking system. Introduction of new prudential standards may require phasing in over several years, sometimes taking into account the pace at which problem banks and their debtors can be restructured and the associated fiscal adjustments can be made.

#### V. The Role of the Fund

Fund surveillance and program design have in recent years increasingly acknowledged the importance of a sound financial sector, as demonstrated in the annual surveys of capital markets developments, the inclusion of financial sector reform in many Fund-supported financial programs, and the 1995 revision to the Staff Operational Guidance Note on Surveillance. 1/ The Fund has been at least implicitly concerned with bank soundness in the past; the international debt crisis of the 1980s demonstrated Fund awareness of the need for soundness of the international banking system, and of principal international banks. 2/ To the extent that the Fund provides a financial safety net for member countries, it can affect the performance of markets and the development of financial institutions across countries. 3/ As noted in the introduction, recommendations of the Interim Committee underscore the need to further address the implications for macroeconomic stability of banking soundness, from both a domestic and an international perspective.

The economic linkages discussed above and in Supplement 1 suggest that strategies for dealing with macroeconomic imbalances will need to consider the degree of soundness of the banking system, and that an understanding of banking system problems is in many cases a prerequisite for analysis of

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1/ See Folkerts-Landau, Ito, et al. (1995), "International Capital Markets - Interim Update of Developments, Prospects, and Key Policy Issues" (EBS/95/196, 11/28/95), "Overview of Developments in Countries with Stand-By and Extended Arrangements Approved During 1988-91" (EBS/94/104, Rev. 1, 3/8/95), "Review of Financial Sector Reforms Under Programs Supported by ESAF Arrangements" (EBS/93/21, 2/8/93), and "Summing Up by the Chairman: Biennial Review of the Implementation of the Fund's Surveillance Over Members' Exchange Rate Policies, and of the 1977 Surveillance Decision" (SUR/95/24, 2/27/95).

2/ See Fischer (1995) and James (1996, Chapter 12).

3/ On the role of safety nets in international financial markets, see Dale (1994).

macroeconomic policies. Against this background, some preliminary considerations are offered on the issues that would arise in comprehensively addressing banking soundness issues in surveillance, program design, and technical assistance. The purpose is to provide a basis for a discussion of the need to strengthen the role of the Fund in these areas. The specific means for meeting such a need is beyond the scope of this paper.

## 1. Surveillance

The treatment of soundness issues as a key component of the "framework of macroeconomic and related structural policies" would depend upon developing an understanding of country-specific structural and behavioral linkages between the banking system and the macroeconomy, and access to information on banking and financial markets for financial system surveillance. The coverage of soundness issues should extend to all Fund members, as recent events in many industrial countries have demonstrated that banking system soundness problems are not limited to developing and transition economies, where such problems often are endemic.

The Fund's surveillance role clearly cannot be as a banking supervisor, but as an advisor on policy. It would encompass an assessment of official oversight systems in relation to market developments and institutional environment and, more importantly, the interactions between financial sector policies for banking soundness and macroeconomic and other structural policies. Fund consultations can help to focus the authorities' attention on the adequacy of the regulatory framework and its enforcement, the need for a strict exit policy for insolvent banks, and the desirability of adherence to international standards and norms of cooperation on supervisory issues. These considerations can be incorporated as part of Article IV consultations in many ways, ranging from additional background analysis based on cross-country comparisons to specific analyses of sectoral structure in the particular country. <sup>1/</sup>

Staff analysis and discussions with the authorities could attempt to identify the macroeconomic influences of banking system variables, particularly the impact on the transmission of monetary policy impulses. The effectiveness of monetary policy instruments and the constraints on monetary policy transmission can be evaluated in light of the state of the banking system, the likely implications for the banking system of current and proposed macroeconomic policies, and the fiscal consequences of banking system problems. The ability of the banking system to intermediate capital inflows and withstand their reversals is particularly important. On the fiscal side, there is broad agreement that evaluations of policy should take into account any quasi-fiscal obligations or contingent liabilities assumed by the government. These issues have been addressed in some recent Fund

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<sup>1/</sup> Staff reports have increasingly begun to include such analysis, especially for Central and Eastern European countries as well as selected AFR and WHD countries.

policy discussions. However, additional work needs to be done to develop a set of indicators and an operational framework that will help Fund staff identify and evaluate current and prospective conditions of a banking system and their interface with macroeconomic and structural policy.

For analysis of credit flows and banking sector soundness, data on gross credit flows as well as prudential and microeconomic information will be needed. Fund missions may not have access to all such data required for a full assessment of the soundness of a country's banking system and the linkages to the monetary transmission mechanism. 1/ However, even without complete data, contributions can be made to understanding the impact of banking system performance on macroeconomic policy.

The development of standards for the publication of economic and financial data by Fund members has been the subject of recent Board discussions. 2/ These have focused on the importance of improving the accuracy, consistency and timeliness of monetary and other macroeconomic statistics, which are critical for the Fund's work. 3/ Similar reasoning applies to financial statistics that permit the analysis of banking sector issues. The authorities play a major role in setting the ground rules for accounting and valuation as well as for disclosure by banks and other financial institutions, and in developing the regulatory framework that insures the reliability of data that are disclosed. The potential for improving the quality of data and, thereby, domestic market discipline (and the working of international financial markets) argues for Fund encouragement of countries to improve their market disclosure standards. Supportive measures can be incorporated into Fund policy discussions and recommendations. 4/

In short, there is considerable scope to expand the breadth and rigor of coverage of banking sector issues in Fund surveillance. These efforts, of course, must be balanced against staff resource constraints and the need to address developments in other sectors.

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1/ Often such reliable information may not even be available to the national supervisors.

2/ See "Standards for the Provision of Economic and Financial Data to the Public" (SM/95/175, 7/17/95).

3/ Such statistics should also seek to present assets at realistic market values as is recommended in the draft IMF Manual on Monetary and Financial Statistics.

4/ For example, the recent Staff Report on the 1995 Article IV discussions with Japan recommended that bank disclosure requirements be expanded and made more consistent, and that increased transparency be sought through changes in accounting standards (SM/95/160, 7/18/95, p. 29).

## 2. Design and implementation of Fund-supported programs

Fund-supported adjustment programs have made efforts to incorporate policies supporting banking and financial sector reforms, including those to strengthen official oversight. 1/ Such policies may be based on technical assistance work by the Fund or programs supported by financial sector loans from the World Bank. However, in many cases progress in such structural reforms has been slow, largely because the reforms are complex and may take several years, but also due to a lack of sustained effort by the authorities. 2/ In some countries, Fund-supported programs have been delayed or have gone off track due to problems in the banking system. 3/ Thus, the design of programs that adequately incorporate the macroeconomic policy implications of banking sector problems and the structural measures to deal with these problems remains a challenge.

Consistent with the surveillance framework outlined above, the focus on banking sector soundness objectives could be sharpened both in policy design and in the phasing of structural measures. Policy assessment and program design will need to distinguish between factors which affect the programming framework and policy mix from those which reduce the effectiveness of certain instruments. In this context, the appropriate relative weight of monetary/exchange rate and fiscal adjustment, as well as the design of specific instruments, needs to be assessed in view of banking system soundness considerations. The existence of a latently unsound or distressed banking system does not mean a credible monetary program cannot be designed. 4/ However, a monetary program which does not attempt to take into account the implications of the status of the banking system may not be credible and sustainable.

Costs of addressing banking system weaknesses need to be assessed and incorporated into the fiscal and monetary programs; such transparency is important for policy formulation. This said, though, not all costs can be quantified at an early stage. A first step is to grasp fully the nature of the government's realized and contingent liabilities, such as the negative net worth of state-owned banks, deposit guarantees, government credit guarantees and central bank credit exposure to insolvent banks. The appropriate treatment of the uncertainties related to contingent liabilities in a financial program is an issue on which further work is needed. If costs of bank restructuring are to be incorporated in a Fund program, this would

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1/ See EBS/93/21 (2/8/93), EBS/94/104, Rev. 1 (3/8/95), and "Review of Operations and Experience Under the Systemic Transformation Facility (STF)" (SM/95/49, 3/8/95).

2/ See "Summing Up by the Acting Chairman - Overview of Developments in Countries with Stand-By and Extended Arrangements" (BUFF/94/69, 7/15/94).

3/ For example, Argentina, Jamaica and Latvia (all in 1995).

4/ Appendix III discusses approaches to macroeconomic management and program design when the banking system is unsound.

require a clearly defined restructuring strategy, 1/ and contingency mechanisms or adjustors to allow for uncertainty in loss estimates. These issues will be addressed in a separate paper on systemic bank restructuring under preparation by FAD and MAE. 2/

In program countries where it is evident that the banking system is already vulnerable as well as in those where banking sector problems exist but have not yet emerged into the open, certain structural measures to strengthen the banking system should be incorporated as part of Fund adjustment programs. 3/ Such measures may need to be applied promptly if they are to produce the desired effects on bank efficiency and solvency. They may range from improvements to the framework in which the banking system operates and prudential policies, to rehabilitation programs for groups of banks or particular banks. The sequencing and phasing of structural policies should take due account of their influences on macroeconomic policies. Given that many structural policies produce results only gradually, it would be important to base any program on realistic expectations of results.

### 3. Technical assistance

Surveillance and program design have long been supported through Fund technical assistance work. Over the last 30 years, the Fund, through its Monetary and Exchange Affairs Department (formerly CBD), has been providing technical assistance to strengthen banking regulation and supervision, and thus support banking system soundness in member countries. 4/ In recent years, the focus on banking supervision and banking system problems has intensified, and taken the form of: (a) technical assistance missions by headquarters-based staff, often including consultants and/or experts from cooperating central banks; (b) short-term expert visits; (c) long-term

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1/ Such a strategy should include financial and operational restructuring of banks and parallel measures to strengthen prudential control and loan recovery.

2/ Systemic bank restructuring and resolution strategies also have been the subject of recent MAE work, including a workshop to take stock of experiences in Central and Eastern Europe (see Lindgren, et al., 1996).

3/ During the March 1993 review of experience under ESAF-supported arrangements, Directors "emphasized the need to press ahead with bank restructuring, improvements in banking supervision, and the legal and institutions changes for the transition from direct to indirect instruments of monetary control" (BUFF/93/11, 3/24/93, p. 1.).

4/ Technical assistance advice has followed the lines described in Supplement 2 to this paper and its appendices.

resident advisors (some of whom are supervised by the Fund although provided by others); and (d) participation of MAE staff or consultants in area department missions. 1/

Advice and operational support through technical assistance programs have covered all major areas of banking supervision and regulation, including strengthening the legal and regulatory framework, licensing, off-site monitoring and on-site inspection practices, streamlining enforcement techniques, reforming loan valuation, accounting and reporting standards, and designing early warning systems and deposit insurance schemes. In recent years, there has been increased emphasis on exit policy for banks, including strategies for dealing with individual problem banks, banking crises and systemic bank restructuring.

To facilitate high-powered support, the Fund has established long-term secondment arrangements for senior bank supervisors from member countries and has developed a panel of available experts worldwide. In addition, MAE has collaborated with other departments providing technical assistance, particularly LEG and STA, in addressing reforms in financial sector legislation and money and banking statistics, which help develop the framework for sound banking.

Enhanced attention to soundness issues in Fund operations would require that technical assistance be more closely integrated with surveillance and program design activities than before.

#### 4. Coordination with other institutions

Other international and regional institutions are active in addressing issues related to the soundness of banking systems. 2/ In particular, the Basle Committee and the World Bank play important roles in this area, with the former focusing on enhancing the conduct of prudential control and the latter on financial sector modernization through financial sector adjustment loans and other sector operations. The European Commission also has been active in providing technical assistance to economies in transition through the EC-PHARE and EC-TACIS programs.

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1/ During fiscal year 1995, bank supervision issues were addressed by 22 MAE technical assistance missions. In addition, MAE placed long-term advisors in some 25 countries, and conducted six workshops and seminars on bank supervision and resolution issues. In total, roughly one quarter of MAE's total (headquarters and field) resources was allocated to banking sector issues.

2/ Technical assistance is also provided on a bilateral basis by central banks and national government agencies such as USAID.

The Basle Committee leads international efforts in supervisory cooperation and regulatory harmonization. 1/ So far, the Basle Committee has promulgated recommendations and standards for consolidated supervision and capital adequacy, and, as mentioned above, is formulating policies in other key areas, such as the regulatory treatment of market risks and operations in derivatives. Although the Basle Committee essentially is a G-10 institution, its recommendations are increasingly seen as the global standard, which many non-G-10 countries seek to adopt. The Fund has developed a very close working relationship with the Basle Committee (and the BIS) under which information is shared and some training activities are coordinated. The Fund's role is complementary to that of the Basle Committee as the Fund is seeking to build on the best supervisory practices recommended by the Basle Committee and apply those practices to country-specific legal, operating, and market conditions. It should be noted, however, that the Basle standards often cover areas of limited relevance to developing and transition countries, which frequently do not have the financial infrastructure necessary to facilitate the use of G-10 standards and practices.

There is scope to enhance international coordination on banking sector issues among a broader range of countries than those cooperating under the auspices of the Basle Committee. This can be done through regional groups of supervisors, which have been organized in East and Southern Africa, West and Central Africa, for the Arab countries, the Caribbean, Central and Eastern Europe, the EU, the Gulf Cooperation Council, Latin America and the Caribbean, SEANZA (Asia) and for countries with off-shore centers. The regional groups seek to share experiences, harmonize practices and, on occasion, develop standards on a regional basis to complement those of the Basle Committee. The Basle Committee supports these groups and has promoted the creation of some of them. 2/ MAE has participated in working parties and meetings of these regional groups as a way of leveraging its technical assistance and promoting harmonization of regulatory and supervisory practices.

The World Bank, and increasingly also regional development banks, are assisting countries in addressing banking sector problems in the context of structural adjustment lending and loans to support financial sector development and rehabilitation. Technical assistance resources available from all institutions are limited relative to current and potential demand. The decision as to which international agency will take the lead in developing a financial sector reform program in a particular country often depends on which institution happens to be substantially involved at the time when a problem emerges. In practice, World Bank involvement is limited to countries in which it has a specific lending operation in place or under consideration; however, in the latter case, technical assistance may not be

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1/ Dale (1994) discusses the evolution of international efforts from cooperation to harmonization.

2/ See Basle Committee on Banking Supervision (1994).

forthcoming until a loan is disbursed. The Fund is often well placed to provide immediate assistance to countries based on its prior technical assistance involvement, where other organizations are not involved or their loans have not yet come on stream. 1/ To avoid duplication of efforts, active cooperation with other institutions is sought, often initiated by MAE or the Fund area department involved.

There remain gaps in the international oversight framework for banking operations to be filled by strengthening existing procedures and improving communications between supervisors. Fragmented international supervision allowed the failure of BCCI in 1991 (addressed by subsequent Basle Committee guidelines on consolidated supervision by home country authorities) and of Meridien Bank in 1995 (which occurred despite those guidelines having been issued). 2/ Policies for bank liquidation and restructuring typically are purely domestic, despite the clear need for international coordination in many cases. 3/ In certain circumstances, the Fund could facilitate cooperation in cases of international banking problems outside G-10 countries, by promoting a consultative framework within regional bodies or even at the Fund's initiative. 4/

The Fund is in a unique position among international institutions in that it covers virtually all countries and has access to expertise, both in-house and from member central banks, on a broad range of supervisory issues

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1/ For example, in recent years the Fund, the Inter-American Development Bank (IADB) and the World Bank all were involved in Mexico, Peru and Venezuela. In Mexico the lead was taken by the World Bank, which already was negotiating a financial sector loan, while in Peru, the lead was taken by the IADB, also under a financial sector loan. In Venezuela the lead was taken by the Fund, which had been substantially involved in earlier technical assistance directed at the financial sector, where neither of the other two institutions were substantially involved. Both in Mexico and Peru, MAE provided technical assistance in close cooperation with the Bank and IADB until additional technical assistance could be funded under each institution's respective loan operations.

2/ International supervisory coordination was also an issue in the recent Barings and Daiwa cases.

3/ The spillover effect due to the way in which the 1974 failure of Herstatt Bank was handled is a classic example.

4/ This would be consistent with Article VIII, Section 5, par. c: "The Fund ... shall act as a center for the collection and exchange of information on monetary and financial problems ..." The lack of a forum for international cooperation among supervisors became clear during the crisis of the Meridien Bank in Africa, the Bahamas and Europe last year.

and policies. 1/ The Basle Committee provides policy recommendations on some specific supervisory issues, but does not get involved in legislation, accounting, valuation, taxation, or resolution issues, nor in a host of other issues of lesser importance in G-10 countries. The World Bank is involved in nonindustrialized countries, and regional development banks only in their respective regions. Meanwhile, the Fund conducts regular broad-based consultations with all its members and is often deeply involved in the design and implementation of economic reform programs. In addition, the Fund has acquired knowledge of financial sector issues through its technical assistance and international market surveillance activities. It is particularly well placed in transition countries and some developing countries as a result of its intense involvement in the development of these countries' central banks. This involvement has included extensive participation of experts from cooperating central banks in work on banking system and supervision issues.

The Fund is thus well placed to advocate improved regulation, supervision, data disclosure, and resolution strategies, in coordination with other agencies, to complement their work by setting structural issues in banking in a macroeconomic context, and to contribute to international harmonization of prudential policies.

#### 5. Resource implications

The strengthened attention to soundness issues in Fund operations would imply an intensification of ongoing efforts, as summarized below:

(a) provide additional technical assistance, as needed, in prudential banking supervision and resolution of banking problems and integrate this activity closely with surveillance and use of Fund resources operations;

(b) raise awareness, through Article IV and other consultations, of banking soundness as an objective of macroeconomic and structural policy, and as a constraint on policy mix;

(c) Encourage economic policies which will contribute to a stable banking environment;

(d) Incorporate into Fund-supported programs measures which enhance soundness and recognize the costs of unsoundness;

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1/ In reviewing recent developments in international capital markets, "Directors noted that important challenges remained in the areas of international cooperation and coordination of regulatory and supervisory requirements ... While welcoming the strengthening of supervisory and regulatory arrangements in the framework of the Basle Committee, some Directors urged the staff to consider further the potential contribution of the Fund to those endeavors, particularly in view of the universality of the Fund's membership" (BUFF/95/44, 5/30/95, p. 3.).

(e) encourage membership to adopt appropriate standards, and to cooperate in international supervisory harmonization initiatives; and

(f) ensure that Fund policies, such as those on data disclosure, are as supportive as possible of these standards.

As mentioned above, these efforts already are ongoing in many countries and are also reflected in many structural adjustment programs. Sharpened analysis of and focus on banking sector issues in surveillance and program design will require additional efforts on the part of country teams. To some extent, this may be addressed with existing resources, if supported with a broad-based training effort to strengthen banking sector expertise, especially among area department staff. In addition, there may be need for participation of MAE experts in area department missions, or in parallel visits coordinated with area departments; this will require a refocussing of MAE resources from technical assistance to support for program and/or surveillance activities. Since intensified surveillance of the financial sector seems warranted in a large number of Fund members, a selection of priority countries for such surveillance would be inevitable. Finally, to the extent that banking system problems become more severe in many member countries (and there are signs that this will be the case in several economies in transition), additional resources may be required, especially to provide technical assistance in the implementation of systemic bank restructuring strategies.

## VI. Issues for Discussion

1. This paper has argued that the banking sector is an important and particularly vulnerable structural component of the economy, the soundness of which has significant implications for macroeconomic policy formulation. What are Directors' views on the implication that the Fund should treat banking soundness as a legitimate objective of policies as well as an important policy constraint in surveillance discussions, program design, and technical assistance?
2. Do Directors agree that the design of stabilization policies should be complemented by concomitant structural reforms to foster banking system soundness? Do Directors agree with the implication that the pace of stabilization might need to be adjusted to take into account the effectiveness of policies to restore soundness?
3. What are Directors' views on the proposed policy framework for maintaining banking system soundness? In addition to macroeconomic stability, the framework would include a balance between comprehensive official surveillance and market discipline, underpinned by transparency of data, firm exit policies for insolvent institutions, as well as well-designed lender of last resort and limited deposit guarantee facilities.

4. What are Directors' views on the observation that the system of official regulation and supervision should constantly evolve in response to market developments and innovation in banking in order to ensure banking system soundness and macroeconomic stability?

5. Successful financial sector liberalization and the adoption of market-based monetary instruments require appropriate operational sequencing of policies to foster banking soundness. Do Directors agree that the speed of transition to indirect instruments can be affected by the pace with which banking soundness can be restored? Do they also agree that the proper sequencing of prudential and stabilization policies can lead to successful liberalization?

6. The need to identify government contingency costs for guaranteed assets and liabilities in the banking system and their transparent inclusion in the formulation of macroeconomic policies is well acknowledged. Do Directors agree that such considerations should be included in the regular policy discussions between members and the Fund? What are Directors' views on the implication that the effective inclusion of contingent liabilities in program design requires formulation of a systemic bank restructuring strategy that pays due attention to banking supervision, bank resolution strategies and institutional arrangements for loan recovery?

7. Do Directors agree with the proposal to shift part of Fund resources from provision of technical assistance toward surveillance activities of banking and financial sector issues in support of area departments?

8. Do Directors see a role for the Fund in supporting international cooperation and harmonization in banking supervision in regions outside of the G-10 framework?

### Predicting Systemic Bank Unsoundness

This appendix addresses modeling and predicting unsoundness in individual banks and in banking systems. Previous empirical work has concentrated largely on individual banks. However, several avenues of research are open to investigate indicators of systemic unsoundness, and further work in this area is needed.

#### 1. Predicting unsoundness at individual banks

Supervisors in some countries have constructed sets of indicators designed to provide an early warning that a particular bank is likely to experience difficulties. These indicators consist principally of bank specific information provided by the reports banks make to the supervisory authority ("call reports"). Early warning indicators are usually used to determine where scarce supervisory resources would best be deployed in on-site examination.

Where data are available, some supervisors have constructed more complex models to identify where severe problems are likely to develop. These empirical models identify factors that raise or reduce the probability of bank insolvency in any period. The characteristics of an individual bank can then be fed into the estimated equation to estimate its soundness. The relevant characteristics are mostly bank-specific, but may also incorporate sectoral information (such as the concentration of the local banking market) and macroeconomic information (such as the regional unemployment rate). The results of these models are used by supervisors to identify banks that warrant greater supervisory attention, for example, in the form of more frequent on-site inspections.

There has been considerable published academic work in this area as well. <sup>1/</sup> Again, models try to predict whether a particular bank is likely to experience difficulties, often defined as insolvency. Published work has focused on the additional question of predicting failure, which is distinct from insolvency. Insolvency is determined by events in the banking market; a bank either is insolvent or is not. Failure in most cases hinges upon a supervisory decision, which may or may not be taken, and may be taken before or after insolvency. Thus, the likelihood of insolvency and the timing of failure may depend on different, but related, factors.

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<sup>1/</sup> Demirgüç-Kunt (1989) provides a survey. See also Cole and Gunther (1995), Gilbert and Park (1994), Thomson (1992), and Whalen (1991).

Nevertheless, since regulators and other analysts all define an unsound bank in a similar fashion (focusing principally on insolvency), comparable sets of variables are used in most approaches. 1/ One key difference is that models used by regulators have access to a bank's prior supervisory ratings. For example, the Federal Reserve's Financial Institutions Monitoring System (FIMS) uses prior composite supervisory ratings as one of the predictors of future ratings. 2/ Such information is not normally available to outside investigators. While they do have access to some of the data underlying supervisory ratings, such as capital and earnings data, they would not normally have access to information on management and asset quality derived from on-site examinations. Research by supervisors has shown that using data from both on-site inspections and "call" reports results in more accurate forecasts than relying on either alone; FIMS provides one example. In practice, however, supervisors tend to watch a larger number of variables than those identified by researchers. 3/ Despite these difficulties, models using publicly available data have been successfully formulated and applied.

Much of the published work has focused on the United States, whose large banking sector, extensive recent experience with bank failures, and well-developed statistical reporting systems have provided abundant data. Translating this work to other banking environments will require further research. However, since the basic financial operations of banking are the same across countries, the sets of relevant variables would be expected to be similar.

Research has generally concluded that a relatively small number of variables can accurately identify at an early stage those individual banks that will ultimately become insolvent (while avoiding incorrectly flagging banks that will survive). A summary of some of the variables used is provided in Table 1, along with the expected direction of the effect of each variable on the probability of insolvency. Variables include traditional measures of capital adequacy, asset quality, management, earnings, and liquidity. The impact of macroeconomic conditions on banks is captured in some of the variables used. Recognizing that a bank will not remain well-capitalized unless it operates efficiently, some models also include measures of operating efficiency and market structure. 4/

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1/ A notable difference is the set of variables used by Clare (1995). That study applies an arbitrage pricing model based principally on macroeconomic variables to estimate the probabilities of failure among individual U.K. merchant banks.

2/ See Cole, Cornyn and Gunther (1995).

3/ For example, see U.S. Office of the Comptroller of the Currency (1989).

4/ Assessing efficiency through financial performance indicators, such as earnings relative to assets or relative to employees, requires some control for market structure; a monopolist may be inefficient, but still show high earnings.

Most of the anticipated effects are straightforward, but some are more complex. In general, supervisors should be concerned about banks with unusually high or low financial ratios. For example, a high capital-to-asset ratio which will cause a low rate of return on equity (ROE) (which may lead to hostile takeover activity that can have positive or negative implications for bank soundness), while a low capital ratio implies a high probability of default. A low loan-to-asset ratio implies that banks are not carrying out their intermediation role, and may be involved in other, possibly speculative, activities, whereas a high ratio indicates high exposure to credit risk.

## 2. Predicting systemic unsoundness

Very little empirical work has been done on predicting systemic unsoundness. In part this is because the supervisory approach tends to be a bottom-up concern with individual banks first, and with the system only as the sum of all banks. A number of approaches to predicting systemic unsoundness could be taken. Three of these are summarized below, followed by a brief review of some recent literature.

### a. Bottom-up approach

A bottom-up approach to systemic soundness would estimate the probability of insolvency developing for each individual bank in the economy, based on a model similar to those summarized in Table 1. This data would then provide the basis to construct a distribution of bank assets by probability of insolvency. A concern for systemic stability would be warranted when the probability of insolvency becomes significant for a large proportion of the country's banking assets, or when that probability increases substantially in any period of time. The appropriate cutoff point or range is a matter of judgment, and will depend in part on the risk-aversion of the supervisor or policymaker undertaking the evaluation.

While a full distribution provides a more complete picture, a single measure of the condition of the banking system might be constructed as an asset-weighted probability of insolvency based on the probability of insolvency for each bank. The sum of asset-weighted probabilities will range between zero (when all banking assets are housed in banks with no probability of insolvency) and 100 (when all the nations' banking assets are in banks with a probability of insolvency equal to one).

The principal drawback to applying this methodology is that sufficient bank-specific data to estimate the underlying model is not readily available for most countries. A secondary drawback is that it does not systematically take into account the different functions which banks may play in a market, and the degree of interaction between banks. Banks with certain functions, such as key payments centers, may be more important to the functioning of the system than simple asset-weighting shows. The degree of interaction between banks, for example, interbank market exposure or overlapping exposure to certain sectors, will determine the extent of potential domino or contagion effects.

b. Aggregate banks

Given the difficulty in obtaining bank-by-bank data, it might be useful to estimate the probability of systemic insolvency using aggregate banking sector data, which is often published by central banks or other official statistical sources. The approach here would be to apply a model based on single bank characteristics similar to those summarized in Table 1 to a synthetic aggregate bank. In this case, the model would probably have to be developed using cross-sectional data from countries with similar financial systems, since time series data for a single country might not provide sufficient instances of systemic insolvency to establish the necessary econometric relationships. The model could then be applied to the aggregate bank data to determine the probability of systemic insolvency for that system.

One significant drawback to this approach is that aggregation may hide problems. For example, while the capital-to-asset ratio is used as an indicator of individual bank condition, it is not possible to adequately assess the strength of the banking sector as a whole by looking at an average, even an asset-weighted average of the capital-to-asset ratio. <sup>1/</sup> A distribution of bank assets by capital ratio is needed to assess the vulnerability of the banking system to systemic crisis. When a significant proportion of banking assets is held by undercapitalized or insolvent banks, the banking system is unsound. An aggregate measure would not always provide this information.

Another drawback would be the difficulty in estimating the model from cross-country data. First, defining systemic insolvency presents a number of challenges, although one might alternatively focus on predicting the extent of likely undercapitalization. Legal, regulatory, financial infrastructure, political and even cultural factors come into play in determining the degree to which a bank may be subject to losses, runs, and failure. Direct comparability across countries will be difficult to establish, but analysis using countries with similar economic structures or at similar stages of development might yield worthwhile insights.

c. Macroeconomic factors

The influence of macroeconomic conditions on the banking sector is discussed in Supplement 1 to this paper. The analysis provided there suggests that selected macroeconomic variables could function as indicators of banking system unsoundness. Indeed, some of the models described in

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<sup>1/</sup> For example, two banking systems each with ten equally sized banks might have an average capital-to-asset ratio of zero percent. In one system, each bank could have zero capital and so offer the public no sound banking options. The other might consist of half the banks with capital ratios of 10 percent and the other half with minus 10 percent. This system offers sound options to the public.

Table 1 employ macroeconomic variables to predict problems at specific banks. One would expect these same variables to be significant for the soundness of the system as a whole.

Banks are derivative institutions in that their health reflects the health of their customers, which in turn reflects the health of the economy as a whole. Instead of looking at bank balance sheet data for internal sources of unsoundness, it should be possible to establish systematic relationships between economy-wide variables and an indicator of bank soundness, such as capitalization. A number of macroeconomic variables would be expected to affect the banking system or reflect its condition. Broadly speaking, these can be grouped as indicators of macroeconomic conditions and indicators of financial fragility. The former group would include GDP and sectoral growth rates, indices of industrial activity, and indicators of macroeconomic balance, such as capital account, current account, and fiscal balances. The latter group would include data on money and credit, interest rates, asset price indices, consumer credit, corporate indebtedness, and bankruptcy rates. Qualitative variables reflecting the financial infrastructure and regulatory environment might also be useful.

Data availability for most of these variables should be high. Estimation of an insolvency probability model might again require cross-country data. However, the approach might provide a means of estimating the impact of particular events, such as a fall in asset prices, on the banking system as a whole. Where bank specific data are available, these macroeconomic factors could be applied to individual banks, to derive their sensitivities to particular factors. Even where bank-specific data are not available, some insight into the sensitivity of the banking system as a whole to these factors could be derived from aggregate data, as described (and subject to the caveats noted) above.

#### d. Recent literature

Recent literature has begun to look systematically at banking crises across countries with a view to better understanding the contributing factors. <sup>1/</sup> The methodology applied has been a case study approach: examples of countries that have experienced crises are selected, and common macroeconomic trends surrounding the crisis are analyzed. The work is, thus far, largely qualitative. Some of the variables which have been characterized as contributing to the emergence of a crisis are listed in Table 1. This work has not yet progressed to the point of econometric analysis and prediction.

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<sup>1/</sup> See, for example, Baer and Klingebiel (1995), Caprio and Klingebiel (forthcoming), Garcia (1994 and 1995), and Hausmann and Gavin (1995). A precursor to this work is Sundararajan and Baliño (1991).

Table 1. Early Warnings Indicators of the Probability of Bank Insolvency

Variables <u>1/</u>	Expected Effect <u>2/</u>	Federal Reserve FIMS <u>3/</u>	Models Surveyed by Demirgüç-Kunt <u>4/</u>	Arbitrage Pricing Model <u>5/</u>	Macro Studies <u>6/</u>
<b>Capital</b>					
Capital adequacy	-	x			
Loan loss reserves/assets	-	x			
Bank size (ability to raise capital)	-		x		
<b>Asset quality</b>					
Loans past due 30-89 days/assets	+	x			
Loans past due 90 plus days/assets	+	x			
Nonaccrual loans/assets	+	x			
Foreclosed real estate/assets	+	x			
Safe investment securities/assets	-	x			
Rate of asset growth	+	x			
Loans/capital	+		x		
Loans/assets	+/-		x		
Sectoral loans/assets (various sectors)	+/-		x		
<b>Management</b>					
Examiners' on-site rating of management	+	x			
Previous overall on-site rating	+	x			
Corporate structure	+		x		
Operating expenses/total revenue	+		x		
Non-interest expense/total revenue	+				
<b>Earnings</b>					
Net income/assets (ROA)	-	x			
Loan revenue/total revenue	+/-		x		
Revenue from secure assets/total revenue	-		x		
Change in interest and fee income/assets	-		x		
Change in interest expenses/assets	+		x		
<b>Liquidity</b>					
Large certificates of deposit/assets	+	x			
Liquid assets/total assets	-		x		
Interest sensitive funds/total funds	+		x		

Variables <sup>1/</sup>	Expected Effect <sup>2/</sup>	Federal Reserve FIMS <sup>3/</sup>	Models Surveyed by Demirgüç-Kunt <sup>4/</sup>	Arbitrage Pricing Model <sup>5/</sup>	Macro Studies <sup>6/</sup>
<b>Market structure</b>					
Local banking market concentration	+/-		x		
<b>State of the economy</b>					
Deposit growth rate	+/-		x		
Price of oil	+/-		x	x	
Corporate default risk	+			x	
Current account balance	+			x	
Inflation/deflation	+			x	x
Bond yields	+			x	
Equity yield	+			x	
Bank lending	+			x	x
Terms of trade	-				x
Real GDP	-				x
International capital flows	+/-				x
Exchange rate changes	+				x
Asset price bubble	+				x
Policy shocks	+				x

<sup>1/</sup> Similar variables have been grouped together; for example, for capital adequacy, some studies use net worth/assets while others use various versions of capital/assets. These are not shown separately.

<sup>2/</sup> This column indicates the direction of effect that an increase in each explanatory variable is expected to have on the probability of bank insolvency.

<sup>3/</sup> Financial Institutions Monitoring System. See Cole, Cornyn, and Gunther (1995).

<sup>4/</sup> Demirgüç-Kunt (1989).

<sup>5/</sup> Clare (1995). This study is shown separately because its approach is significantly different from those surveyed in Demirgüç-Kunt (1989).

<sup>6/</sup> Hausmann and Gavin (1995), Garcia (1995).

### 3. Conclusion

Determinants of bank unsoundness include not only financial indicators of the condition of individual banks, but also the economic situation, the external environment, and the infrastructure that affect all banks. Further research is needed to develop early warning models for systemic unsoundness. Several approaches have been outlined here.

The difficulties in making these approaches operational should not be underestimated. First, individual bank data do not exist, or are inaccurate and outdated in many countries, presenting such a large errors-in-variables

problem as to call into question the validity of any empirical estimates of the probability of insolvency. Second, there could be in some instances more explanatory variables than banks, presenting a deficiency of degrees of freedom. Third, techniques that rely on valuations from the equity and bond markets are not useful in undeveloped financial markets. Fourth, failure usually depends on the same variables that determine insolvency, but failure is ultimately a regulatory decision subject to misincentives, forbearance, and political interference. Insolvency, not failure, should be the dependent variable in such empirical exercises. However, since banks are difficult to value, market value insolvency may not be observed or measured except after failure.

These difficulties do not preclude all progress. Given the importance of systemic banking problems, further research efforts in this area would be valuable.

Macroeconomic Effects of Prudential Regulations

As discussed in the main text, bank activities affect macroeconomic conditions, particularly in the monetary area. Prudential policies and regulations which delimit bank activities will therefore have macroeconomic implications. Much of the concern in this area has been over capital requirements, which receive most of the focus here. However, other prudential regulations present similar concerns.

1. Capital standards

A frequently cited example of the influence of prudential policies on monetary and macroeconomic conditions is the impact of the 1988 Basle capital standards on credit conditions in the major industrial countries. There was an apparent slowdown in credit growth in a number of countries during 1988-91, which appears to have lengthened or worsened cyclical downturns. It may have been the case that this slowdown, referred to as a "credit crunch," was the direct result of the increase in capital which banks were required to hold against assets. Banks might have responded to the new capital requirements by reducing the volume of credit extended or by increasing their interest margins to build up own-capital. However, it is difficult to fully substantiate whether capital constraints contributed to the credit slowdown, since the demand and supply schedules for loans are not directly observable. The evidence is mixed, but there is some theoretical and empirical support for a capital induced credit crunch. <sup>1/</sup>

Capital adequacy requirements can affect credit expansion in two distinct ways: they compel banks to build up sufficient capital at the time when ratios are initially imposed, and they compel banks to reduce risk assets when the capital constraint becomes binding. To some extent, these rules reinforce what should occur naturally. Banks should maintain adequate capitalization to support the risks they assume. Problems surrounding a rise in capital requirements should be transitory, and may reflect other

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<sup>1/</sup> Cantor and Wenninger (1993) note that it is difficult to isolate the contribution of capital adequacy requirements on the U.S. credit crunch of 1988-91. However, Brinkmann and Horvitz (1995) present evidence that growth in lending by banks with less excess capital under the new standards was slower than the growth of lending by better capitalized banks. Bank of England (1991) concludes that the U.K. credit slowdown resulted from decreased borrowing capacity and bank concern to tighten standards and improve profitability, not from problems in meeting the international capital adequacy standard. Fairlamb (1994) suggests that in Japan, capital was a constraint on lending. Shinagawa (1993) presents evidence that Japanese banks widened their margins and adopted a more restrictive lending stance from 1988 to 1991, but concludes that wider bank margins did not reduce the macroeconomic impact of looser monetary policy, and that the reduction in credit was mainly demand driven.

distortions. 1/ If default rates rise in an economic downturn, capital will be reduced. Total assets will also decline as loans are written off, but the loss in asset carrying capacity will be greater due to the leveraging of bank capital. 2/

The effects of an economic downturn on bank assets will result in reduced capital due to loan write-offs. Thus, minimum capital ratios tend to be procyclic, binding during recessions and asset price depressions. 3/ However, capital adequacy ratios will also dampen volatility in the longer term. Thus discussion of the effects of the Basle capital accord needs also to take into account the timing of implementation. Had stricter capital standards been applied in the early 1980s, a larger capital cushion would have been available to absorb losses later in the decade, and capital might not have become a binding constraint on credit growth. 4/

## 2. Other prudential instruments

Concern for macroeconomic effects extends also to other prudential instruments, including liquidity, interest exposure, foreign exchange exposure, loan limits, and other prudential standards. 5/6/ These may constrain banks' asset allocation, resulting in higher costs or reduced income, and increasing interest rate spreads. For example, if prudential regulations require banks to hold more liquid assets, and these yield less than other assets the bank might have chosen, the reduced income will be reflected in wider spreads. Loan loss provisioning will similarly increase bank expenses and contribute to wider spreads.

Excessively stringent regulations may be cause for concern. However, to the extent that prudential regulations merely force a recognition of the true costs of doing business safely, the higher price paid by borrowers and the lower yield to borrowers depositors do not mean that regulation has

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1/ Such as an asset price bubble resulting in overextension, which then becomes difficult to reverse to meet a higher capital-to-asset ratio.

2/ If a loan of 100 is written off, minimum required capital would decline by 8 but actual capital would decline by the full 100.

3/ See Goodhart (1995).

4/ In addition, the asset price inflation which resulted in those losses might not have occurred to the same degree; see Alexander and Caramazza (1994). Cantor and Wenninger (1993) present views that the regulatory shortfall lay in not containing the excesses of earlier years.

5/ Romer and Romer (1993) link a number of historical periods of tight money in the United States to regulatory action, in particular to actions regulating interest rates.

6/ Reserve requirements may also have an impact on both banks and the macroeconomy (see, for example, Chari, Jones and Manuelli (1995) and Spiegel (1995)). However, while reserve requirements overlap liquidity rules to some extent, reserve requirements should be considered monetary rather than prudential instruments.

created additional costs for banks. Rather, wider interest rate spreads reflect a shifting of costs away from the deposit insurer or lender of last resort and onto the consumers of banking services.

Regulations may have spillover effects on other financial instruments. Prudential rules on liquidity management by commercial banks typically also affect demand for, and yield of, liquid assets such as treasury bills and commercial paper. In addition to the possible impact of system-wide regulations on bank lending and interest rates, actions taken to limit the activities of certain banks may also have an impact. For example, supervisory intervention to limit deposit acquisition by weak banks may remove a source of upward interest rate pressure. The actual effects of prudential regulations will ultimately depend on the particular circumstances of the banking system and the economy as a whole.

### 3. Cyclical adjustment of prudential regulations

Prudential requirements should not be viewed as an additional monetary policy tool. While regulations could potentially be adjusted over time to produce procyclical or countercyclical effects on the economy, such an approach to prudential regulation is likely to introduce conflicts of interest within the central bank and weaken the banking system in the long run. For example, expansionary policy could be reinforced by reducing capital requirements. 1/ However, this policy tool could be difficult to reverse, with the result that over time the banking system could tend toward lower levels of capital and greater risk of insolvency.

It has been argued that monetary policy may be less effective when the constraint on bank expansion is capital, since the central bank can control access to, or the cost of, borrowed funds, but does not control the supply of bank capital. 2/ While that is true, there are many aspects of credit creation which the central bank cannot control, such as the supply of bankable projects and the credit screening process. Central banks normally do not seek to control these aspects of credit creation, since it is not desirable to expand the supply of questionable credit. Similarly, the central bank should not seek to expand the supply of credit based on an insecure capital foundation.

Prudential policies should be devoted to creating a framework for sound banks rather than diverted to cyclical demand management. Arguments against maintaining strict prudential standards on monetary management grounds seem excessively focused on short term considerations. 3/ In the medium to long term, there is no inconsistency in striving for effective monetary

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1/ This is suggested by Goodhart (1995).

2/ See Brockelmann (1995).

3/ During periods of economic stress, banks should be encouraged not only to maintain adequate levels of capital, but to build up additional capital if possible, for example, by refraining from paying dividends. Of course, this may be difficult for the less sound banks.

control, strong banks, and sound prudential policies. In fact, as explained in the main text, an effective system of prudential regulations which fosters a sound banking system will increase the flexibility and effectiveness of other monetary policy instruments, which should provide adequate monetary control in a reasonably stable economy.

4. Transition arrangements

The policy approach which must be derived from an understanding of the potential short-run effects of raising prudential standards is that any changes in prudential regulations should be phased to take account of the capacity of the banking system to adjust and of broader macroeconomic trends. An increase or decrease in capital adequacy ratios can leave the banking system starved of or flush with capital. Either could cause problems, depending on current and prospective macroeconomic conditions. Therefore the Basle Capital Accord was phased in over a period of four years. Similarly, the introduction of new or higher liquidity, interest exposure, loan limits, and other prudential standards needs to be undertaken with due regard for the short-term effects on the banking system and the monetary stance. Prudential policies should be tightened gradually. Any forbearance which may be required must be monitored and phased out under an enforceable compliance timetable.

### Financial Programming When the Banking System Is Unsound

This appendix outlines some of the considerations which apply to financial programming for an economy in which the banking system is unsound. In order to clarify some points regarding monetary control, a basic balance sheet description of the banking sector is developed first.

#### 1. Bank balance sheets and the monetary survey

Issues in financial programming when the banking system is unsound can be illustrated with reference to a simplified set of bank balance sheets and a monetary survey.

The balance sheet of the central bank consists of holdings of foreign assets, domestic assets (which comprise lending to banks and to government), and liabilities consisting of commercial banks' required and excess reserves, currency in circulation, foreign liabilities, and capital. <sup>1/</sup>

$$\text{Central Bank: } FA_c + DA_c + DA_g = RR + ER + CC + FL_c + K_c$$

The balance sheet of a commercial bank comprises holdings of foreign assets, loans, required and excess reserves (including deposits at the central bank and vault cash), and liabilities consisting of domestic deposits (including those denominated in foreign currency), foreign deposits, borrowing from central bank, and capital.

$$\text{Commercial Bank: } FA_b + DA_b + RR + ER = DD + FL_b + DA_c + K_b$$

The monetary survey aggregates these balance sheets,  $\Sigma$  being the sum across commercial banks:

$$(1) [FA_c + \Sigma FA_b - FL_c - \Sigma FL_b] + [\Sigma DA_b + DA_g] + [-K_c - \Sigma K_b] = CC + DD$$

This is commonly summarized as

$$(2) NFA + NDC + OIN = CC + DD$$

$$(3) NFA + NDA = M$$

Growth in money can come about due to rise in NFA, NDC, or OIN:

$$(4) \Delta NFA + \Delta NDC + \Delta OIN = \Delta M$$

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<sup>1/</sup> This exposition abstracts from payments system float and from the valuation account recording changes in the net foreign asset position resulting from changes in the exchange rate. Currency in circulation is used here instead of currency issued because cash in bank vaults is included in required and excess reserves.

The soundness of banks will be reflected in banks' ability to maintain appropriate levels of reserves ( $RR + ER$ ) and in bank capitalization ( $K_b$ ). Asset quality ( $FA_b + DA_b$ ) will tend to be poor among troubled banks, both as cause and result of bank unsoundness. The type and quality of liabilities will be affected; unsound banks facing liquidity difficulties may turn to interbank deposits or various forms of distress borrowing that are less stable and more costly than typical demand deposits. They may also change the mix of domestic and foreign sources of funding ( $DD + FL_b$ ), or may be forced to rely on borrowing from the central bank ( $DA_c$ ). Finally, in the simplified monetary survey defined here, a fall (rise) in OIN is the result of changes in banking capital due to profits (losses) of the central bank and commercial banks. 1/ Thus, each of the components of the monetary survey can be affected by the presence of problem banks.

## 2. Monetary program considerations

Banking system losses will result in an increase in OIN and NDA. If the central bank incurs losses and there is no change in the NDA of the central bank, the balance sheet identity requires an increase in CC or a reduction in NFA or NDC. Since the central bank is, in the final analysis, a branch of the Government, its losses are clearly fiscal in nature--ceterus paribus, a central bank loss means higher government borrowing to compensate for lower (or negative) profit transfers. This usually means an increase in NDC and an increase in the rate of money creation. 2/

In the case of banking system losses, the effect on broad money can be seen by examining the multiplier relationship. 3/ The money multiplier is a function of the currency to deposit ratio preferred by the public and the reserve to deposit ratio maintained by the banking system: 4/

$$(5) \quad m = (1 + CC/DD) / (CC/DD + (RR+ER)/DD)$$

Bank unsoundness, and in particular losses, will tend to put pressure on bank liquidity. Unless unsound banks have continued unrestricted access to interbank funds, they will usually be forced to reduce their holdings of reserves relative to deposits; this may take the form of shortfalls in required reserves held at the central bank as well as depletion of excess reserves. Such adjustments in reserves would tend to raise the multiplier,

1/ In a more complete balance sheet, changes in OIN would reflect other factors, in particular valuation gains or losses.

2/ Central bank losses are dealt with in greater detail in SM/95/65.

3/ Broad money can be represented as  $M = m \cdot H$ , where H is high powered money and m is the money multiplier. Changes in H reflect changes in the central bank balance sheet. Changes in m reflect changes in banking system intermediation.

4/ See, for example, Dornbusch and Fischer (1981), p. 270.

and would be most in evidence when there is widespread severe unsoundness. 1/ At the same time, public preferences may shift toward holding more currency relative to bank deposits, or toward holding less domestic currency and more foreign currency. 2/

Banks pay salaries and other expenses using their own funds, essentially transferring deposits held in their own accounts to the accounts of their creditors. 3/ If an enterprise is making losses and has depleted its own resources, it cannot pay salaries and other expenses. Unlike other enterprises, however, a bank has no liquidity constraint, since there is a ready supply of depositor funds. Instead of transferring its own funds to pay its creditors, the bank can use customer deposits. Technically this is done by running a negative balance on the bank's capital account, but the liquidity comes from depositor funds. 4/ The banking system's reserve to deposit ratio has decreased, increasing the money multiplier.

Such changes in monetary ratios will reduce the effectiveness of direct monetary policy instruments. For example, when a banking system credit ceiling is binding, money deposited at a commercial bank is essentially "parked" there; it can be held as excess reserves, but will not recirculate in the economy. When banks use new deposits to pay expenses instead of holding these funds as excess reserves, the bank allows deposits to re-enter the economy, rendering the credit ceiling ineffective as a means of controlling the growth of NDA of the banking system and broad money. A ceiling on banking system NDC might be observed, but a monetary program based on NDC will fail to account for the economic and monetary impact of increases in NDA.

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1/ In less extreme cases, the increased uncertainty in interbank markets might result in stronger banks holding higher levels of reserves, such that aggregate reserves across the system could actually rise.

2/ The net effect on the multiplier is an empirical matter (see Sundararajan and Baliño, 1991). The money multiplier increased sharply in five of the eight cases studied in Appendix II of Supplement 2 to this paper; in all but one case, increased volatility of the multiplier was evident.

3/ If these creditors, for example, bank employees, convert their deposits to cash, there is no change to M either at the time of conversion to cash or when the funds are spent and redeposited by the next recipient.

4/ Essentially, the bank has created new deposits backed not by credit extended or cash in its vaults, but by increasingly negative capital (losses). The impact of this type of leakage is an empirical matter and will depend on the relative magnitude of banking system losses; in Tanzania in 1994/95 banking system losses accounted for over one third of the growth in banking system NDA (see "Tanzania--Staff Report for the 1995 Article IV Consultation" (SM/95/291, 11/9/95)).

Monetary programming at the level of the central bank's balance sheet could ameliorate these problems somewhat, since the central bank's NDA may be more directly controlled. 1/ For example, it may be useful to set a ceiling on central bank credit to banks, to prevent a redistribution of banks' liabilities from resources provided by the public (DD) to resources provided by the central bank ( $DA_c$ ), which could occur if unsound banks have trouble attracting sufficient deposits at affordable interest rates. 2/ However, the use of indirect instruments and the establishment of a monetary program at the level of the central bank rather than at the level of the banking system must also take into consideration the soundness of the banking system. Instruments focused on the central bank balance sheet have a reliable impact on broad money or interest rates and on ultimate objectives, such as the price level, only if the transmission mechanism is reasonably stable. As noted above, the relationship between reserve and broad money is likely to become less predictable as the banking system becomes more unsound. Greater uncertainty with respect to banks' excess reserves would be expected in periods of growing unsoundness, complicating indirect monetary control. The presumed link between reserve money and the price level could not be the same across the range of banking soundness. Furthermore, the responsiveness of banks to standard monetary policy instruments is likely to be impaired because of the various incentive issues discussed in the main text.

### 3. Setting and monitoring monetary program targets

The quantity of money appropriate for an economy in which the banking system is unsound may be difficult to predict. Demand for money may rise due to uncertainty and asset liquidations, or fall as savers shift to safer assets, including foreign currency. 3/ In many countries that have experienced banking crises, the ratio of M2 to GDP fell. 4/ However, it is often difficult to distinguish the effects of unsoundness from other macroeconomic and structural disturbances.

Furthermore, in a situation where the banking system is making persistent losses, there will be a bias toward monetary growth which must be addressed in the monetary program. Even when quantitative performance criteria are observed, the intended qualitative results may not materialize. For example, a targeted growth in credit which was intended to support productive economic activity may be diverted, with a greater proportion going to the financial sector (as losses/negative capitalization) rather than to other public and private sector activities. Because monetary expansion can occur through increases in OIN, a  $\Delta$ NDA target would be

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1/ See Alexander, Baliño, and Enoch (1995).

2/ Such a ceiling could also help to control discount window or lender-of-last-resort lending.

3/ See Sundararajan and Baliño (1991), pp. 16-17.

4/ See Johnston and Pazarbaşıoğlu (1995).

superior to a  $\Delta NDC$  target. 1/ The NDA target itself may be constructed as the difference between projected money and the international reserves target. However, to implement a credit policy consistent with the NDA target, some projection of the components of  $\Delta OIN$ , including banking sector losses, should be made. 2/ If targets are set at the central bank level, the standard adjustors for changes in reserve requirements should, of course, be included in the program.

As noted in the main text, the use of indirect instruments may be limited, and recourse to direct instruments such as credit controls may be necessary in the short run. However, the specific instrument mix will have to be tailored to the particular circumstances. Being required to hold unremunerated excess reserves resulting from restrictions on credit or interest rates would further weaken banks. A combination of indirect and direct instruments is likely to be required to both maintain monetary control and avoid additional adverse effects on the banking system.

Measuring actual credit emission becomes difficult when sound banking practices are not in place. Recorded flows of funds may not balance due to unrecognized losses, or to the extension of "credit" to capitalize interest. This would correspond to a rise in broad money with no change in base money. The true counterpart is a reduction in net bank capital and reserves, although these are not recognized as being lower.

As classified above,  $\Delta NDC = \Sigma \Delta DA_b + \Delta DA_g$ . Central bank lending to government will be determined by the fiscal balance. Changes in the level of loans to the private sector are expected to be translated into higher levels of economic activity. However, if a large portion of the banking system's loans are nonperforming, much of the growth in NDC may represent capitalized interest on nonperforming loans rather than new sources of finance for productive enterprise. When the nonperforming loans are to public enterprises, adherence to the  $\Delta NDC$  target would entail additional crowding out of the private sector. However, allowing increased credit growth would not, in general, be an appropriate solution. Rather, proper application of loan classification, provisioning of loan losses, and suspension of interest accrual on nonperforming loans should be put in place, along with efforts to liquidate assets and generally clean up bank balance sheets. Such actions would help insure that compliance with credit targets is both economically and statistically meaningful.

In summary, development of monetary programs and targets should try to take account of potential distortions in statistics and shifts in the transmission mechanism. Assessment of the actual policy stance may require adjustment of statistics to better portray banks' positions and distinguish

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1/ All but one Fund-supported programs are currently monitored through NDA rather than NDC ceilings.

2/ Quasi-fiscal activities of public financial institutions also are important determinants in the movement of OIN; see SM/95/65, page 4, footnote 1.

between credit expansion due to unsound banking practices and credit expansion due to loose monetary policies. The appropriateness of particular monetary targets needs to be carefully assessed, and the level set consistent with expected changes in monetary relationships. In addition, due regard should be given to the availability of instruments which are likely to function well enough to allow the central bank to actually meet these targets. For example, it may be necessary to increase compliance with required reserve requirements (or choose instruments potentially more effective in the current banking system environment) rather than raise the required reserve ratio.

4. Fiscal program considerations

Quasi-fiscal activities of the banking system, which can result in losses and government liability, are largely dealt with in a recent Board paper, and will not be addressed here. 1/ As a banking system becomes more unsound, it will provide less tax revenue. The reduced profitability of banks should be recognized by permitting tax deductibility of loan loss provisions. 2/ Even if this is not allowed, eventually the reduced revenue-generating capacity of the banking system will have to be acknowledged as losses mount. Thus, revenue projections in this area should be formulated conservatively.

More difficult is the question of expenditure projections. While in some cases the government may incur obligations to borrowers or bank shareholders, in most cases the principal government obligation is in the form of loan and deposit guarantees. These normally extend beyond public financial institutions to private sector institutions as well, regardless of whether their insolvency is due to involvement in quasi-fiscal activities. Such guarantees, even if funded through an independent agency, virtually always involve some degree of contingent liability for the government.

These fiscal concerns need to be addressed in two ways: by minimization of the government's contingent liability and by allocation of appropriate resources in the budget to cover these liabilities. The former will involve, inter alia, policies designed to improve bank soundness, as well as carefully formulated deposit insurance and lender-of-last-resort policies. The latter will require quantification of the contingent liabilities that the government has assumed and the likelihood that they will be called.

The potential cost to the government depends on the degree of insolvency of the guaranteed institutions and the nature of those guarantees. Insolvency cannot be assessed solely in aggregate, as the aggregate figures may allow the presence of banks with comfortable capital

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1/ See SM/95/65.

2/ See Dziobek (1995).

levels and high asset quality to mask significant problems at other banks. 1/ Furthermore, the final value of banking system assets will be difficult to predict: extensive liquidations could drive down asset prices, but a credible bank restructuring program could also boost confidence and aid in a recovery. Furthermore, there is no unambiguously accurate way to determine the extent to which the contingent liability to the government represented by deposit insurance shortfalls is likely to fall due. The probability of failures or bank runs is unknown, so expected value calculations are difficult to produce.

Nevertheless, consideration of a few factors may provide useful indications. The extent of current insolvency, measured by the negative net worth of problem banks based on the best available portfolio assessments, will provide one measure; uncertainty surrounding this measure centers on the quality of the portfolio assessment. This could be supplemented by sectoral performance analysis and index-based measures of changes in asset prices in the economy, weighted by average bank portfolio composition, if such data are available. 2/

While these considerations provide an estimate of the size of the cost, there is also the question of when the bill will actually fall due. Banking system problems can and have been ignored for some time in many countries. Provided banks have adequate liquidity, there are no additional policy or economic shocks, and there is reasonable public confidence that eventually the problem will be solved, there may be no crisis.

Although the budget is viewed on a cash basis and contingent liabilities are not usually included, once the need for government-supported rehabilitation has become evident, the government's potential liabilities could at least be incorporated into the medium-term fiscal program. One way to accomplish this would be to provide a fiscal set-aside. This could take the form of budgetary resources to increase the funding levels of any deposit insurance program. However, any such earmarked set-aside should be undertaken in the context of a program of intervention or monitoring of banks to limit moral hazard. At a minimum, one would want to see sufficient resources in any government-backed insurance fund to deal with the claims that would be expected to result from any known problem banks. The flow contribution to the set-aside would enter the fiscal accounts. The resources could be in the form of securities; the flow in the fiscal accounts would then be the interest payments to the fund (and later to the

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1/ Clearly, if the system in aggregate shows a shortfall, there is a problem; it is the converse which is not necessarily true, unless deposit insurance is mutually funded and the insurance system will transfer sufficient resources from solvent to insolvent banks. In most deposit guarantee systems, however, there is no redistribution from sound banks to unsound banks.

2/ See Lockett (1970).

banks or their creditors when these securities are transferred to them) and the principal would represent an increase in government domestic indebtedness.

Any quasi-fiscal role of the central bank should be taken into account as well. To the extent that the central bank becomes involved directly in purchasing bad assets or providing other forms of unsecured resources, the banks' negative net worth should be transferred explicitly to the public sector. In several countries, the central bank has assumed the non-performing assets of the banking system, either by direct transfer of problem assets to the central bank (usually in exchange for government or central bank securities) or through lender-of-last-resort facility borrowing by insolvent banks, which may or may not be backed by realizable collateral. These transfers may initially hide the fiscal effects of problem bank resolution, but, in effect, differ little from direct government transfers. The resulting central bank losses will reduce profit transfers to the budget, and can increase liquidity creation. 1/

#### 5. Setting fiscal program targets

In designing targets for a fiscal program, a number of approaches might be taken. Ideally, an estimate of the likely fiscal costs would be incorporated in the program. For example, the authorities could agree in advance on contingent fiscal measures which would be activated upon the realization of a contingent liability. However, if the additional expenditure, net of the contingent fiscal measures, exceeds the program targets, it would then be necessary to consult with the Fund.

Alternatively, along with efforts to quantify the costs at an early stage, a contingency mechanism could be included in the program to handle deviations. Fiscal program targets could be designed with an adjustor for the amount of contingent liabilities realized. Adjustors should be limited to amounts that would allow some degree of (perhaps temporary) accommodation without threatening the achievement of program objectives, and would have to be carefully defined and limited so as to place the emphasis on appropriate reductions in other expenditures. The advantage to this approach would be that it requires explicit consideration of the impact of contingent fiscal liabilities, while retaining a certain amount of flexibility and acknowledging the difficulty in quantifying the fiscal cost ex ante. 2/

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1/ For example, in Chile, central bank cash losses due to purchases of nonperforming loans from commercial banks averaged 1.2 percent of GDP in 1984-86, but have since fallen to 0.3 percent of GDP in 1994 ("Chile--Recent Economic Developments" (SM/95/204, 8/17/95, p. 27)). Vos (1995) recounts how government assumption of nonperforming bank assets in the Philippines contributed to central bank losses which accounted for one third to one half of the public sector deficit from 1982-92. See also Leone (1993).

2/ This is consistent with the recommendations of SM/95/65, Appendix I, p. 34.

Both of these approaches have, in fact, been used. In general, Fund-supported programs have (at least ex ante) required offsetting fiscal measures to accommodate excesses in recurrent expenditures associated with financial reform. Some programs have also included contingency mechanisms to allow for excesses in one-off expenditures; this approach can be successful only if there is a clearly defined program of financial sector reform and restructuring, as, otherwise, it could create incentives to delay recapitalization or other interventions that have recurrent costs in favor of one-off crisis management expenditures which would qualify to adjust the program target.

In all cases, cash-based measures of the fiscal position should be supplemented by a measure of the value of contingent liabilities outstanding. 1/ Even if strict quantification is not possible, such an exercise would highlight the nature of the liabilities which the government has assumed, encourage increased risk monitoring and control, and possibly encourage early closure of increasingly insolvent banks. In some cases, it may be possible to create an unallocated budgetary reserve, although the integrity of such a reserve may prove difficult to maintain when the overall fiscal position is precarious. 2/

#### 6. Balance of payments considerations

On the external side, the principal concern is that banks will attempt to compensate for reductions in domestic resources with increases in foreign liabilities. Thus, a reduction in  $K_b$  resulting in a rise in OIN could be compensated by a fall in NFA (rather than, or in addition to, a rise in M). The potential impact depends in part on the reversibility of previous capital inflows. In addressing this, it will be important to assess the foreign exchange exposure positions of the banks, as well as the degree of maturity matching and the quality of foreign liabilities and assets.

#### 7. Longer-term considerations

An important corollary to the relationship of bank balance sheets to the monetary survey and of bank soundness to the monetary program which has been outlined here is that in situations of widespread bank recapitalization and/or rehabilitation, the bank restructuring program, must in aggregate, be consistent with the projected growth of domestic monetary aggregates and accumulation of capital. Specifically, deposit growth rates projected in the microeconomic analysis of banking sector restructuring must be bounded by the overall monetary program. In addition, it must be recognized that any sector's spending beyond its income must be financed by the savings of other sectors. 3/ Real banking capital cannot be created out of air or

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1/ See SM/95/65, Appendix II, and Premchand (1995).

2/ See Premchand (1995).

3/ See IMF (1987).

paper. 1/ Projected rates of recapitalization should be compared with expected capital inflows and domestic capital mobilization possibilities. If the government ultimately provides capital injections in the form of securities, the additional debt service and long-term obligations must be consistent with the overall carrying capacity and any longer-term commitments or goals with regard to public debt.

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1/ For example, recapitalization through government securities issues must represent a commitment to divert real fiscal resources, over time, to the banking sector. If this is not accomplished, funding the securities is likely to be inflationary, resulting in an erosion of their real value.

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