Abstract

As developing countries and economies in transition have relied on deregulated, competitive markets to spur growth, their central banks have shifted toward using open market operations as a tool of monetary policy. To be most effective, such operations require supportive changes in other policy instruments (reserve requirements, discount window), a competitive banking system and securities market, and adaptation of particular open market or market-type instruments used to the stage of, and potential for, market development. The paper assesses options available to a central bank for encouraging a competitive market architecture and designing instruments for implementation of open market operations.

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1/ Mr. Axilrod, a consultant with the Fund during February-May 1995, wrote the main body of this paper. Mr. Gonzalo Caprirolo was principally responsible for the instrumental tabulation presented in Appendix I, and Ms. Mitra Farahbaksh wrote the country study presented in Appendix II. The author wishes to acknowledge the helpful comments provided by Mr. Balino and his colleagues in the Monetary and Exchange Affairs Department, and by the Fund's area departments, as well as in discussions with Ms. Farahbaksh and Mr. Caprirolo.
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Open market operations have become ever more important to developing countries and economies in transition that are increasing their reliance on deregulation and on market forces. For these operations to become key to monetary policy, other monetary instruments need to be adjusted. Some access to the discount window is desirable to smooth market response to monetary policy and to offset unexpected financial shortages. Although reserve requirements may be lowered or even eliminated, a minimum "binding" requirement will still be required as a link between open market operations and the desired monetary stance.

Transforming markets for effective use of open market instruments usually occurs in two stages. In the first, because secondary markets are weak or nonexistent, the central bank is limited to open market operations in primary markets, such as auctions of new Treasury issues. These primary market operations are particularly useful when they encourage the emergence of active and competitive secondary markets.

In the second stage, active secondary markets tend to develop, which is crucial for continuous open market operations at the Central Bank's initiative. A central bank can stimulate such development by encouraging an interbank market, offering financing facilities for market participants, working toward a sound legal and regulatory framework, formalizing the market's business relationship to the central bank, introducing competitive auctions for central bank or treasury operations, publishing market statistics, and, crucially, fostering a speedy, reliable, and safe clearing and settlement system.

For open market operations, the best secondary market segments are in the government securities sector and in short maturities, because government securities are usually free of credit risk and operations in short maturities entail less chance of the central bank dominating markets, which could forestall market development and bias the information content of interest rate movements. Repurchase transactions are especially useful, as money management generally requires large and frequent operations. Moreover, these transactions aid market growth by making the underlying securities collateral more liquid without directly interfering with market forces.

In the absence of cumulative budget deficits and a significant market in government debt, some central banks have relied on private money market paper for their open market operations. Since reliance on private paper is risky, adding a special Treasury issue to the central bank's portfolio and then auctioning a corresponding Treasury deposit liability constitute a useful alternative.
I. Introduction

Open market operations have become the major instrument of monetary control in developed countries. In those countries, the evolution of well developed, active interbank, money, and securities markets has enabled central banks to undertake outright or repurchase agreements (RPs) in securities or foreign exchange as needed to provide or absorb bank reserves.

The advantages of open market operations are well known. The instrument provides great flexibility in the timing and volume of monetary policy operations at the initiative of the central bank; permits an impersonal, market-oriented business relationship with counterparties; and avoids the economic and market inefficiencies of direct controls.

In today's globalized financial world, the flexibility of open market operations is also becoming increasingly important to countries with developing or transitional economies as their markets evolve—become more deregulated, more competitive, and more closely integrated into world markets. At earlier stages of market development—when highly flexible two-way open market transactions by the central bank in well developed money and securities markets are not practical—certain open market-type instruments can be, and have been, employed to secure many of the advantages of more fully evolved market operations.

Such instruments would generally be employed in primary markets and include auctions of a central bank’s own securities, auctions of Treasury securities for monetary policy purposes, and credit auctions through the open market function. They have some of the features of broader open market operations since the monetary authority gains more initiative in its operations, interest rates are or can be market-determined, and there is a more impersonal business relationship with counterparties.

However, as a country continues to grow and its markets evolve in sophistication and depth, the central bank should become increasingly able to employ open market operations even more flexibly in active secondary markets for government securities and money market instruments. Because of the added flexibility gained for monetary policy from the presence of active, competitive markets in such instruments, it would also be desirable for the central bank as well as other arms of the Government to take regulatory and other steps that may be needed to encourage market development. That would not only help create the conditions for a stabilizing and market-enhancing monetary policy but would also help encourage, through demonstration effects, the development of competitive markets in and across other financial and also nonfinancial sectors.

Countries which lag in the development of primary and secondary markets would have to rely for the most part on other, more direct instruments of monetary control—such as reserve requirement changes, terms and conditions for access to the central bank’s discount window, or changes in quantitative credit restrictions on commercial banks and other institutions. These may
be quite effective for a time, especially for countries in earlier stages of
development and without exposure to a broad and sophisticated spectrum of
markets, investors, lenders, and borrowers.

However, as a country's economy and markets expand, policy
implementation that is basically limited to the more direct instruments of
control tends to become less effective because markets eventually find a
way around them, and especially so in a globalized world. And even if such
an approach turns out to be highly effective, at least temporarily, it may
well be associated with stop-go policies or with uncertainties generated by
the Government's role in credit allocation that are damaging to long-run
business and financial planning.

Use of market instruments in policy implementation would enable the
central bank more flexibly and smoothly, and with less distorting side
effects, to phase in adjustments to the bank reserve and monetary base that
may be needed as the nation's financial structure changes, usually
unpredictably, in the process of economic growth and transition. More
generally, market instruments, because their use is entirely at the central
bank's initiative provide a relatively reliable tool for attaining control
over the longer-run growth in the nation's money or credit aggregates and
inflation, assuming the bank has the will to do so. On a more technical
level, a market instrument also gives the central bank added flexibility for
adjusting the size of its reserve operations in light of the ongoing market
response to its policy intervention—perhaps a particularly important
advantage in emerging markets where there is likely to be less of an
experiential basis for gauging the response in advance.

This paper focuses on the practical role in monetary policy
implementation that can be, and has been, taken by various forms of open
market and market-type operations in developing and transitional economies;
on their advantages and disadvantages; and on the market conditions that may
influence, and abet, the transition from operations in primary markets to
more highly flexible two-way operations in secondary markets.

The next two sections of the paper discuss the transformation of other
monetary policy instruments and of market structure needed to enhance the
effectiveness of open market operations. Section II focuses on adaptations
in the central bank's credit facility and in reserve requirements. Section
III then evaluates market structures most suitable to use of the open market
instrument and the role that the central bank might play in encouraging
them—bearing in mind that markets emerge in a step-by-step process whereby
more limited or open market-type operations may be introduced in the early
stages partly as transitional measures.

The design and practical use of various open market and open market-
type instruments that have been, or could be, used in primary and in
secondary markets is analyzed in section IV in relation to market

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circumstances, the central bank's operating guides, and the government's debt and cash management policies. A fifth and final section offers some concluding observations.

Empirical material is presented in detail in the appendices. Appendix I tabulates market instrument use in fifteen developing or transitional countries in relation to market structure, policy objectives, use of other monetary instruments, and debt management. Appendix II contains case studies for five countries (Brazil, Indonesia, Mexico, Philippines, and Poland) that highlight the evolution of open market-type and open market operations in nations with differing financial systems and traditions.

II. Open Market Operations in Relation to Other Monetary Instruments

If open market operations are to be the principal instrument for policy implementation, other monetary instruments obviously need to be adjusted supportively so as to ensure that day-to-day operating objectives are attainable and that the chances of reaching intermediate-term monetary guides, such as the money supply, are maximized. The need for adjustment applies particularly to the discount window, where the banking system can obtain reserves at its own initiative. There are also reserve requirement issues. The structure of requirements not only affects the predictability of the multiplier relationship between bank reserves and the money supply but also influences banks' speed of response to open market operations.

The kinds of complementary adjustments in other monetary instruments that are most effective depend in part on the particular strategy adopted for conducting day-to-day open market operations. In general, they can be conducted in one of two ways. They can be actively aimed at a given quantity of reserves, letting the price of reserves (a money market or interbank interest rate) fluctuate freely along with fluctuations in the pressure on banks' liquidity. Or open market operations can be aimed at a particular market interest rate, letting the amount of reserves provided at the central bank's own initiative be determined passively as a function of demand at that price.

Given the inherent volatility of money demand and a central bank's desire to avoid policies that risk destabilizing markets, a passive approach to open market operations is often followed. In that case, the central bank would provide whatever reserves are needed to accommodate the demand for bank deposits and required reserves that actually emerges during a particular operating period (e.g., anywhere from a week to a month depending on the span of time over which banks must meet their reserve or clearing balance requirements on average). If the monetary authorities were not following such an approach, the banking system, in a period when money demands were perhaps temporarily strong, would either have to draw down
excess reserves, increase borrowings at the central bank's discount window, or undertake portfolio adjustments, with consequent upward pressure on money market interest rates as banks' liquidity positions came under pressure.

While accommodative in the short-run, use of a passive approach to open market operations is nonetheless consistent with a monetary policy that stresses either interest rates or monetary and credit aggregates as intermediate objectives. With the money supply as an objective, the central bank would ordinarily focus on control over a 3- to 6-month or possibly longer period and would accommodate to the week-to-week or month-to-month variations that are generally economically insignificant. Never, control would be dependent on the central bank's ability to estimate the rather uncertain and indirect relationship between a money market rate or bank liquidity conditions and the responses of the banks and the public that influence the money supply.

Whether an active approach to open market policy that takes a particular reserve level—derived from, say, some longer-run path of desired money growth—as a direct target in an operating period would achieve adequate control of money supply measures is also subject to some uncertainty as it would depend on the predictability of the multiplier relationship between reserve aggregates and the money supply. That relationship too may be variable and unstable, especially when financial markets are in process of expanding and modernizing.

Developed countries have normally employed a more passive approach to provision of reserves through open market operations. The most notable exception to such an approach was the policy followed by the U.S. Federal Reserve System from late 1979 to late 1982. At that time the Fed chose a particular volume of nonborrowed reserves (the reserves provided through open market operations) as its short-term operating objective, with the amount determined by its presumed multiplier relationship to policy's money supply objective and an assumption about the amount of borrowed reserves.

The procedure was adopted in inflationary circumstances on the thought that it would result in more assured money supply control and that, after a while, as the policy approach was successfully sustained it would restore the Fed's lost anti-inflation credibility. The highly developed U.S. markets were considered to be resilient enough to absorb the more volatile interest rate movements that were likely to, and did, occur.

The policy was abandoned after inflation was reduced and as it became apparent that changes in financial technology and institutional structure were making the relationship between various measures of money and over-all economic and financial conditions increasingly uncertain. Reserves provided through open market operations were then once again determined passively, guided in effect by money market interest rate pressures.

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In countries with markets in earlier stages of development, the absence of adequate secondary or interbank markets to provide signals about reserve needs and to convey the results of policy would be one reason for taking an active approach to reserve provision. Another reason would be to make the central bank's policy objectives much clearer and more defined, especially when control of an existing inflation is the overriding goal.

Such an active approach is in effect embodied in a number of IMF-supported programs for particular countries where control of inflation may be the predominant concern or where competitive markets may be in an early stage of development. For particular policy reasons, though—for example, the importance of exchange rate and balance of payments stability to the country—such programs may use the net domestic assets of the central bank as a guideline rather than a bank reserve or monetary base aggregate.

In the end, whether a central bank uses a more passive or more active approach to open market operations will depend on the structure of its markets and economy, on the stability and predictability of the relationship between money supply measures and national economic objectives, and on the particular economic or financial issues that are of most concern to policy at a particular moment of time.

1. **Discount window policy**

For open market operations to be an effective instrument of monetary control from either an active or passive perspective, certain limitations need to be placed on access by banks to the discount window. Obviously, if banks could borrow at will from the central bank, open market operations could not be effectively used in an expansionary situation to control the money market rate, or influence total reserves or the monetary base for that matter. Any positive gap between banks' demand for reserves and the reserves supplied through market operations could be readily filled through borrowing at the discount window. As a result, the money market rate would never rise above the discount rate, and any growing demand for reserves would be fully accommodated. In an expansionary situation, open market operations simply could not function as an effective policy lever to exert a restraining influence on money and credit conditions, and the discount rate rather than the money market rate would serve as the anchor rate for the economy. 1/

Thus, to make open market operations an effective policy instrument, the discount window should be designed to deter access to the central bank's credit in one way or another, through a high penalty rate or restrictive guidelines. A penalty rate from one perspective can be construed as an upper limit on money market rates; whether or not it is a limit in practice

1/ Open market operations could still be used to encourage expansion with an open discount window by driving the money market rate below the discount rate.
would depend in part on how it is set (e.g., administratively reset on a periodic basis or automatically set, and whether with a lag or unlagged, at some premium above a market rate) and on whether access to the window at that rate is restricted or unrestricted. Some countries, such as Germany, maintain a dual rate structure comprising a basic discount rate and a penalty Lombard rate and employ open market operations to guide money market rates within the channel.

If a penalty rate is set well beyond current market rate conditions, there is a risk of sharp market reactions to liquidity demands that are unanticipated in open market operations, a situation most likely to arise when such operations are aimed actively at a predetermined reserve aggregate. In such circumstances, as well as more generally, use of guidelines that restrict access to the window may permit a smoother adjustment to developing reserve shortages (relative to demand) in the banking system, at least as compared with a window that is effectively closed by a very high penalty rate. With the window administered to restrict access, short-term interest rates would rise in a tight money period when reserves provided through open market operations are persistently in short supply, but the rise would be buffeted to a degree by the ability of banks to make more orderly portfolio adjustments by borrowing from the central bank for a very limited period (and only after searching actively for funds in the interbank market).

Short-term, temporary borrowing that helps the banking system and markets adjust more smoothly to changes in money market conditions initiated by open market operations should be differentiated from longer-term structural borrowing at the discount window, such as emergency advances to institutions in severe operating difficulties. Longer-term borrowing at the discount window may also be an important means of adding reserves to the banking system in the normal course for countries with markets at an early stage of development, as with Russia and China.

Reserves provided through structural, longer-term borrowing—whether for emergency or other reasons—should generally be considered to be practically the same for monetary policy purposes as reserves provided through open market operations since they are more determining of, rather than determined by, money market or bank liquidity pressures. Their expansionary impact on the reserve base would need to be constrained to be consistent with the central bank's money supply or interest rate objectives. If a market instrument of some sort were available to the central bank, it could be used to absorb any excess creation of what are in effect "permanent" reserves through the discount window.

In any event, at relatively early stages in their market development, a number of developing or transitional countries have limited access to the discount window through penalty rates, guidelines, or moral suasion in the interest of making open market operations more effective. They have also
been influenced by the need to encourage the evolution of a competitive interbank market to help provide a better framework for the further development of open market policy instruments.

Of the countries examined, some allow both short- and longer-term borrowing through their credit facility (Brazil, Ghana, Indonesia, Malaysia, and Poland), while others provide only short-term credit (Czech Republic, India, and Thailand). Countries employing open market operations as a principal monetary instrument have generally taken steps to ensure that short-term adjustment-type credit available through the discount window is not used excessively, if at all.

In the Czech Republic, for instance, the discount window comprises a short-term credit facility at a penalty rate and a rediscount facility with restricted access. In practice, neither facility is used actively, with the central bank's discount rate serving as an indicator of the stance of policy implemented through both open market and open market-type operations. In India, discount window credit is provided through a standing facility to two specialized institutions, with frequent recourse discouraged by the practice of scaling up loan rates. In Mexico, the central bank does not even have a short-term adjustment facility, although it maintains an emergency lending window.

If the discount window is effectively shut for short-term adjustment purposes, its market-smoothing or safety-valve functions are lost, and the full burden of adjustment to shortages of reserves from open market operations falls on excess reserves, overdrafts, or even stronger (than otherwise) portfolio adjustments by banks to extinguish required reserves. In that context, the availability of short-term adjustment borrowing from the discount window can helpfully smooth market response to open market operation by allowing enough access to provide some cushion against unexpected day-to-day financial shortages, but not so much as to offset the basic thrust of monetary policy or, at a more micro level, to hamper the necessary development of interbank markets.

2. Reserve requirements

Reserve requirements can be considered either as an alternative instrument of monetary control implemented through changes in required reserve ratios or as providing a relatively stable fulcrum that may enhance the effectiveness of open market operations by making it easier to predict the money supply or interest rate effects of open market operations. Since open market or closely related operations have become more widespread, changes in reserve ratios have been used less and less as an instrument of monetary control. 1/

1/ See Hardy (1993) for a detailed discussion of purpose and design of reserve requirements.
In any event, when used for monetary control, reserve requirement ratios have the disadvantage of being a relatively crude tool that also tends to complicate internal bank reserve management procedures. Moreover, in modern open and highly competitive markets, reserve requirements may place banks at a significant competitive disadvantage as compared with institutions providing the same or similar services but which are not subject to the reserve requirement tax. In that context, there has been a tendency in many countries either to lower reserve requirements to minimal levels or to eliminate them. 1 /

As a fulcrum to help make open market operations more effective, the exact level for reserve ratios would partly depend on how closely a central bank may wish to control some particular measure of the money supply. Relatively close control would be facilitated if the deposit components of the money supply are subject to required reserve ratios that are at least high enough to be binding in the sense that they force banks to hold more required reserves than they would otherwise voluntarily hold for transactions or clearing purposes. Such voluntary reserves are likely to be subject to more slippage and volatility in relation to deposit levels as banks respond to changing liquidity pressures and other circumstances.

The reserve ratio might also be best expressed as an average pertaining to a relatively short period—say, two weeks. The averaging process would permit banks to manage their reserve positions more flexibly and with less need to establish a large excess reserve buffer that might make the relationship between reserves provided by the central bank and the money supply less predictable. A relatively short period would help assure that responses to monetary policy's intentions were reasonably prompt. Almost all of the countries sampled have a form of reserve averaging, generally ranging from over a two week period to a month.

The argument for reserve ratios that are binding in the above sense is considerably less strong if the central bank's open market operations are not actively targeted on a particular level of reserves derived from the multiplier relationship to some measure of the money supply. The more passive provision of such reserves through open market operations generally requires the central bank to affect only the money market rate or some

1/ Another approach would be to pay banks a market interest rate on required reserves, which virtually eliminates the tax effect. However, commercial banks would still be restricted to some extent in their ability to invest funds based on their own assessment of market conditions and risks. Payment of interest on reserves would also of course reduce central bank revenues commensurately, as well as governmental revenues in some degree, depending on the difference between the government's effective marginal tax rate on the central bank and the marginal tax on commercial banks.
measure of marginal bank liquidity such as excess reserves or free reserves (the difference between excess reserves and short-term adjustment borrowing).

Even in the case of passive reserve provision, however, binding reserve requirements may have some practical use. Their role would depend in part on market conditions, the stage of a country's development, and the policy signals most likely to enhance efficient policy implementation.

Experience to date of certain countries without binding reserve ratios on deposits, such as the United Kingdom, suggests that they are not especially needed. On the other hand, the recent crisis in Mexico—a country that recently abolished reserve requirements—raises questions about whether such requirements might not play a useful role, at least in the technicalities of policy implementation, by tightening the relationship between bank credit or money and open market operations. More broadly, though, the ability to vary reserve requirements as an optimal policy instrument may be useful in circumstances when bank liquidity needs to be expanded or contracted rapidly and clearly signalled.

However that may be, the need for a relatively predictable reserve base to make implementation of open market policy more effective would be greater to the extent that the money market is less developed and unable to provide relatively unambiguous signals about the degree of a funds shortage or surplus in the market. Even in the United States with its highly developed money market, reserve requirements, while being steadily lowered and reduced to zero on time and saving deposits, apparently remain binding on transactions deposits. In developing countries, reserve requirements have for the most part been lowered over time; at least as judged from the fifteen countries tabulated in Appendix I, they also appear to remain at binding levels (with the exceptions of Indonesia, Mexico, and Tunisia).

The ability to make relatively predictable estimates of required reserves seems to be useful to the Federal Reserve in making decisions about the size and timing of open market operations during a short-run operating period. While estimates of required reserves are revised daily as new information about deposits becomes available, they nonetheless provide a benchmark permitting the Fed to come to more reliable judgments about the size and timing of daily operations while also giving weight to the interest rate signals emanating in the money market itself. \(^1\) As noted, these signals could well be more ambiguous in less developed money markets.

\(^1\) The Fed now announces its particular operating objective. More experience is needed to determine whether that makes signals emanating from the money market more or less reflective of underlying conditions or whether it causes the central bank to rely even more on its own statistical estimates of reserve shortages or surpluses in deciding on the size and timing of open market operations.
Because of statistical difficulties in securing deposit data on a current enough basis to estimate required reserves, some countries have based reserve requirements wholly or in part on deposits in a prior period. By basing reserve requirements on earlier deposits—a so-called lagged reserve requirement system—the amount of required reserves and the fulcrum for open market operations during a current open market operating period would be known with reasonable certainty, though deposit revisions and banks' current attitudes toward excess reserves would always be problematic.

While such a system has certain statistical and operating benefits, it has disadvantages if the central bank is attempting to control the money supply by aiming directly at a reserve aggregate—disadvantages that appear significant mainly if the lag between deposits and required reserves is fairly lengthy. Under a lagged reserve requirement system, any undesired expansion in deposits, for example, would not immediately increase required reserves and thus would not automatically add to upward interest rate pressures in the money market.

The tightening in the money market would occur only with some delay when the demand for reserves rose relative to the supply of reserves being provided through open market operations. As a consequence, banks' incentives to take actions that would restrain money growth would also be delayed. The result could be less effective monetary control: at the least, a somewhat larger interest rate increase would be needed for achieving control because the beginning of restraint through open market operations would take place later rather than sooner.

A substantial number of countries examined—including the Czech Republic, Egypt, India, Malaysia, Thailand, and Tunisia—employ a lagged or partially lagged reserve requirement structure. For the most part, however, the length of lag was reasonably short. It was around 14 days—a period that probably would not give rise to excessive technical difficulties in controlling the money supply over an intermediate- or longer-term period of time.

In sum, when open market or open market-type operations are crucial in policy implementation, the most effective complementary reserve requirement structure would depend in part on whether the central bank adopts an active or passive attitude toward reserves provided through market operations. An active attitude, to the extent that it presumes high priority for money supply control, would argue for a binding reserve requirement structure. It would also argue for uniform reserve ratios applicable to the various deposit components of the money supply measure to be controlled—a condition met in relatively few of the countries studied—and for applying the ratios to deposits contemporaneously or at least with a relatively short lag. Efficiency and equity in markets and the economy would be encouraged if the reserve ratios were set as low as possible consistent with being binding.
As markets evolve, it becomes more practical and perhaps even necessary in a more sophisticated financial structure as attitudes toward money change for central banks to adopt a more passive stance toward open market operations. An overnight money market rate or the banking system's marginal liquidity position would then be taken as the day-day-operating guide for open market operations. Under such circumstances, there are still some advantages to a binding reserve requirement structure as a benchmark for judging the timing and size of open market operations. This would be especially important if the money or interbank market is not yet sufficiently developed and competitive, with adequate breadth and depth, to provide reliable signals about emerging tightness or ease.

III. Market Prerequisites and the Role of the Central Bank

In the course of its economic growth, a country's financial markets will evolve generally in the direction of greater breadth and complexity, though the particular institutional form--whether, for example, banks are dominant or share a role in varying degrees with independent securities firms, savings institutions, or others--depends on historical circumstances and Governmental attitudes. As the financial system expands, the market prerequisites for employment of open market instruments in monetary policy implementation should gradually come into place. Experience has shown, however, that the pace and pattern of market development may well need guidance from a country's monetary and other Governmental authorities to facilitate a timely shift from direct to indirect instruments of control if policy is to be most effective as markets become deregulated, unsegmented, and, in today's world, open externally.

The transformation to indirect instruments of control usually involves two stages, first a shift away from direct instruments toward more reliance on employment of open market-type operations in the primary market and then a further shift toward greater use of more fully flexible two-way operations as active secondary markets develop in more mature financial systems. In that context, in addition to their monetary policy function, open market-type operations should be viewed in their long-run structural role as a useful, if not necessary, prelude to the evolution of active secondary markets.

While such operations should be designed to encourage growth in markets and to discourage dependence on the central bank for either meeting liquidity needs or laying off surplus funds, other actions--by the central bank itself (affecting the discount window, for instance), by other Governmental bodies, or within the private sphere--may be more crucial to appropriate market development. This section will focus mainly on how developing and transitional economies can move toward market structures most useful for highly flexible open market operations and on the role that the central bank can play in contributing to the development of such markets.
1. **Suitability of markets for policy implementation**

Highly flexible open market operations require, most ideally, a market structure that features a secondary market for an instrument in which there are a very large number of daily transactions occurring on a continuous, competitive basis involving numerous different buyers and sellers or borrowers and lenders. Such an ideal situation exists in few developing or transitional markets, and was a late development in the more advanced countries. However, as countries around the world have more and more come to appreciate the advantages of a deregulated market environment, competitive price determination, and a discretionary monetary policy aimed at reasonable price stability, the practical usefulness of active secondary markets has become clearer and their establishment has taken on more urgency.

Open market operations of one sort or another can and should be undertaken, of course, in markets that may not be entirely "ideal" but are at varying stages of development in a deregulatory, competitive process. In markets lacking depth and continuity, such operations may need to be limited in size or employed only on a periodic basis. The participation of the central bank should hasten the development of the market not only by enlarging its size but also because the stature and authority of the bank can be used to guide the development of the infrastructure needed to continue the market’s expansion.

In addition to affecting the useability of open market operations, the pace and pattern of market development also affect the liquidity and riskiness of the central bank’s balance sheet and thus, potentially, its credibility and stature. Without credibility, central banks find it much more difficult (than otherwise) to maintain over-all financial stability, as experience has amply demonstrated in both developed and emerging markets.

In that regard, it is helpful if markets perceive that a central bank’s portfolio of assets is highly liquid and essentially risk-free. Thus the most appropriate market structure for open market operations would be one that permits the central bank to acquire such securities over time. If the central bank instead has in the course of supporting economic growth acquired securities which the market believes are illiquid and cannot be sold as needed to avert an inflationary expansion of the nation’s monetary base, then confidence in the bank is likely to falter.

a. **Markets by maturity**

The markets most suitable for sizable and highly flexible open market operations are normally those where the shortest-term instruments are traded, though it should be technically possible and sometimes desirable on policy grounds at times to employ all maturity sectors in operations. The short-term sector, however, is most capable of absorbing frequent in and out official transactions.
When well developed, it is characterized by a large and continuous volume of activity resulting from use of the market by government, financial institutions, and other businesses for day-to-day management of liquidity and cash flow. This makes it possible for the central bank to undertake open market transactions on its own initiative and in adequate size either to shift policy or--what is generally the more frequent type of operation--to offset day-to-day changes in market liquidity that might otherwise signal policy shifts when policy has in fact not changed.

The development of short-term markets in government and private instruments in countries such as the Philippines, Mexico, and Poland--among those studied--facilitated the use of open market-type and later, in certain cases, more full-fledged open market operations. In a number of instances, market development was itself spurred by the central bank's introduction of open market-type operations. The transition to flexible open market operations has, however, proven difficult in some instances, especially for countries without a sizeable volume of government debt outstanding to provide the basis for a risk-free liquid market.

In Indonesia, where the Government is not permitted to run domestically financed budgetary deficits, the central bank took steps to institute an indirect system of monetary management through issuance of its own bills once the more direct monetary controls proved to be unworkable. In addition to issuing its own bills, the central bank also promoted a short-term commercial paper market with a view to developing a two-way instrument that also could be employed to provide reserves over time. However, secondary market activity in both commercial paper and the central bank's own bills has so far remained thin, and transactions are dominated by central bank activity.

Longer-term markets have less capacity than short-term markets to absorb a large volume of open market operations, partly because they usually have less breadth and depth and partly because they are basically riskier. Although they may have some usefulness at times when the central bank is providing reserves or is attempting more directly to influence conditions in the long-term market sector, for the most part they tend to be avoided when the central bank wishes to drain reserves from the banking system.

Reserve absorbing open market operations undertaken in longer-term markets risk a very marked upward interest rate response, at least in the short-run, given the relative thinness of such markets and the inherently larger price risk in longer-term as compared with shorter-term securities. Even with operations to constrain reserve growth undertaken predominantly in short-term markets, there would of course still be some effect on longer-term rates, but it would be more measured. The response of longer-term rates would be unaffected by overreactions to a sudden change in existing demand-supply conditions within the longer-term market itself, and thus
would be a much more useful indicator to the authorities of attitudinal responses to the over-all thrust of monetary policy on the part of the financial community.

The longer-term market would present a clearer picture of the underlying cost of capital in nominal terms, thereby providing some basis for estimating the longer-run inflationary premium that is one useful measure of the credibility of monetary policy. It would also provide business with an effective basis for gauging the present value of future income streams, thereby permitting economically more rational judgments about capital spending plans, given a business's own estimate of the real return on investment and the likely course of inflation.

b. Markets by sector

Looking at markets by type (rather than maturity) of instruments, three sectors present the best opportunities for effective open market operations—the markets for national governmental and central bank securities, for interbank debt, and for very short-term debt instruments issued to the public by financial institutions and other corporate entities (encompassing such instruments as commercial paper, finance company paper, and bank CD's). Of the three, the government securities market presents the fewest complications and is generally preferred for operations, with availability of course dependent on the role of Government in the economy and the amount of debt outstanding resulting from the cumulative net impact of budgetary deficits and surpluses.

The government market, as well as a market for a central bank’s own instruments, is generally thought to be free of the same kind of credit risk found in markets for instruments issued by institutions dependent on cash flow from sale of their services. The taxing power of Government is considered to be insurance against such risk.

In political and economic situations that are highly unstable, however, government debt can be subject to a credit risk in market eyes—a risk of default—that is similar to other instruments. That would of course make it almost impossible to maintain a viable primary market for issuing debt, much less the two-way secondary market that is essential to fully flexible open market operations. Thus, political stability and a sustained Governmental record of meeting interest payments and redemption schedules are essential to use of the open market instrument.

The market for government securities can be effectively destroyed not only by a Government’s failure to meet its contractual obligations. It can also dry up if the central bank pursues an inflationary policy that drives investors, domestic and foreign, out of the market by eroding the real value of the outstanding debt. Thus a Governmental policy aimed at keeping
inflation within acceptable bounds is, in addition to political stability, a precondition to developing and sustaining markets suitable to two-way open market operations of the central bank. 1/

Short-term private 2/ debt markets are not as suitable to open market operations as is the market for government debt in large part because the inherent credit risk in those sectors tends to make for less resilient and thinner markets. But in addition, the central bank can unnecessarily be placed in an awkward position because of issues raised by the presence of credit risk. For instance, if the central bank happens to be on the buy side of the market, counterparties may very well take the opportunity to unload riskier paper. The central bank would find it difficult to avoid purchasing at least some of the paper; if it refused, the market itself would turn away from the paper on the thought that the central bank has access to information unavailable to the market generally (as in practice it may well have).

Such a quandary might be resolved if the central bank were to confine operations to paper carrying ratings above a certain level from an independent rating agency. In Indonesia, the central bank buys commercial paper issued by banks (so-called SBPU’s) that are endorsed by third parties presumably to reduce credit risk.

If the central bank finds that its open market operations have to be carried out in the private money market because there is no government debt or the amount of the debt is declining, operations in commercial bank instruments or in the interbank market may raise fewer credit risk issues than transactions in other money market instruments (such as commercial paper). In contrast to other financial institutions, commercial and often other more specialized banks have what can be considered to be a close "business" relationship with a central bank because they hold required reserve, clearing, or conventional working balances at the institution and because they have access to the central bank's discount window (or if there is no such window, to the central bank's overdraft facility). Moreover, the central bank can easily refrain from operations with any banking institution that borrows from the discount window--whether for emergency or other purposes--thus establishing an objective and understandable basis for distinguishing among counterparties.

1/ However, it is possible to protect investors against inflation by issuing such obligations as indexed or variable interest rate bonds. Brazil is an example of a country that succeeded in developing a market for securities in a context of high inflation.

2/ In this context, the word "private" is used for simplicity to connote institutions whose income and cash flow depend on sale of their services, whether the institution is state or privately owned.
The central bank of Malaysia, for one, undertakes the bulk of its operations in the interbank market, mainly through short-term borrowing to absorb liquidity created by capital inflows. In Indonesia, however, the central bank has chosen not to intervene in the active interbank market but to undertake primary market operations instead in the SBPU’s noted above to provide reserves and in its own certificates (SBI’s) to absorb reserves, with the hope of fostering a secondary market.

c. **The central bank’s balance sheet**

While a central bank in a country without a government securities market should be able to develop other channels for open market operations, there is the risk that acquisition over time of a securities portfolio dominated by private commercial paper and banking assets would make the central bank appear less liquid and indeed a bit less safe than if government debt were the primary source of the nation’s monetary base, always assuming the debt was not being debased by inflation. Private paper may prove difficult to sell at times, especially in crises when a central bank may wish to undertake open market sales to at least partly offset the potentially inflationary reserve impact of increased emergency lending through the discount window.

In such circumstances, the central bank may not be viewed as any stronger than the private banking and financial system itself. That would also make it difficult for the central bank to sell its own newly created securities in an open market-type operation to absorb reserves. It might not be viewed, therefore, as a truly safe guardian against either systemic risk or inflation, thereby increasing the odds on such adverse developments as capital flight at first signs, or rumors, of financial difficulties in key institutions. Financial crises could become at least marginally more difficult to control.

The advantages for operations and for market perceptions of a relatively liquid and risk-free balance sheet for the central bank would be an important reason for confining operations mainly to government securities when practically possible. If a significant government debt market does not exist, consideration might also be given to creating a similar balance sheet effect by developing a special governmental debt instrument that can be used to add reserves over time to the banking system. In contrast to open market-type instruments that have been used to absorb

1/ To maximize flexibility at all times and particularly if faced with potential systemic crises, major central banks generally try to maintain a highly liquid portfolio of government securities. In the U.S., for example, close to 85 per cent of the central bank’s assets consisted of outright holdings of Treasury securities as of March 31, 1995. Of these, almost 30 percent were highly liquid, maturing in three months or less, and about three-fifths matured in one year or less. See *Federal Reserve Bulletin* (1995).
reserves, it would remain as a permanent and also liquid addition to the central bank's balance sheet, substituting to a degree for private assets and in effect "dressing up" the central bank's books. A practical approach to creating such an instrument in the absence of an active government securities market will be discussed in section IV.

2. Regulatory role of the central bank in market development

Open market operations, or monetary policy as a whole for that matter, would work best in a market environment that not only permits competitive determination of interest rates in short-term and government securities markets but also allows variations in those rates—the basic liquidity and/or risk-free rates in the financial system—to be promptly reflected in other markets. Establishment through law and regulation of continuously functioning competitive markets—is thus basic to an effective and more predictable (in its impact) monetary policy.

Normally, the central bank would not have a significant direct regulatory input into or authority over those markets—such for equities or private longer-term debt instruments—in which it has no operating interest. However, it needs to be clearly understood that open market operations, and monetary policy generally, is most effectively implemented when transactions in the nation's various financial markets take place in a regulatory framework that minimizes the chances of micro-market developments—such as a breakdown in the clearing and payments mechanism or major institutional failures—that would inhibit monetary policy's ability to focus on its macro-economic goals.

In the early stages of a country's development, the central bank, given its expertise in and concern for markets, would generally be called upon to provide expert advice as the Government formulates financial legislation and regulations. However, questions about the extent of the central bank's continuing and direct responsibility for regulatory matters would normally be confined to financial areas of immediate concern in its operations—such as the banking system or the government securities market. Even for those markets, however, it is not clear whether the central bank should or should not be a direct regulator. 1/

With regard to the government securities market, the central bank and the Government of course need a reliable market-place in which participants can feel secure that counter-parties will perform and which is transparent and "safe" enough to encourage broad-scale customer participation. The central bank, like any other institution, should establish performance standards for its counter-parties based on its business needs—chiefly, of course, in this case the policy maker needs to be sure that it can attain...

1/ The hotly debated issues about whether a central bank should be the sole regulator of the banking system in all its aspects, share such responsibilities, or not be involved will not be discussed in this paper.
through open market operations its bank reserve and/or short-term interest rate objectives. The central bank is also the natural focal point for market surveillance through gathering information from its counterparties and publishing aggregate market statistics.

However, the central bank may not wish to go beyond these functions and also assume direct regulatory responsibility and oversight. That may unduly tax its limited personnel resources. Moreover, it may unnecessarily expose the bank to a loss of stature and adversely affect its credibility in monetary policy should scandals erupt in the government securities market, as history suggests they inevitably will at some unexpected point or other.

In that sense, it may serve a country's national interest best if a division of labor between monetary policy operations in markets and regulatory authority over the markets were maintained, with a different institution from the central bank having the regulatory power over the government securities market. Nonetheless, whatever the exact regulatory role of a central bank, the public will in any event generally look to it as bearing some oversight responsibility for markets in which it operates and will assume that the continuing presence of the central bank in the market in effect validates the market and perhaps also the various counterparties to the bank's transactions. From that perspective, if not from its own need for markets that make policy operations more effective, the central bank should take steps that help rationalize the market's architecture and enhance its performance.

3. Market architecture and performance

For purposes of implementing open market operations, a central bank would generally prefer a market that is designed for continuous rather than periodic transactions and for immediacy in the execution of trades. In addition, the monetary authority would also have a preference for a market that is transparent and where communication of its operations is prompt so that its activities and purposes are well understood. Continuity and transparency would also be encouraging to the participation by business and individuals that is needed if markets are to become adequately broad and deep.

The central bank can consider a number of steps to encourage the development of an active and broad domestic market for open market operations, though the size of the market and the potential for fully flexible operations, relative to more limited market-type operations, would necessarily be affected by a country's stage of development. These steps include: promoting an interbank market; helping in the design of market instruments and a trading infrastructure; provision of financing facilities.

\[1/\] The role of the monetary authority and other agencies of government in helping to develop markets is discussed in some detail in P. Dattels and P. Bestue-Cardiel (1994).
establishment of criteria for doing business with the central bank's open market function; collection and dissemination of market statistics; and encouragement of a safe clearing and payments mechanism.

a. Interbank market

Apart from its potential noted above as an instrument for open market operations when government securities are not adequately available, an active interbank market is more particularly important to monetary policy because it serves as a pressure gauge for helping to judge the timing and volume of security market operations. As it is extended to encompass both bank and nonbank dealers in securities, it may also be instrumental in the establishment of a viable securities market by making day-to-day financing available on a competitive basis.

A large number of the countries surveyed—both those with and without effective Government securities markets—have developed or are in the process of working toward a competitive interbank market as they move toward an increasingly market-oriented monetary policy with a principal role for open market operations. Among these are the Czech Republic, India, Indonesia, Malaysia, Mexico, Philippines, and Russia.

Most countries have helped encourage the interbank market's development by adjustments in policy instruments as well as through moral suasion and other approaches. While progress in establishing the market has been variable depending on institutional circumstances, the more successful instances so far—e.g., India, Indonesia, Malaysia, and Mexico—have been accompanied by discount window policies that discourage, penalize, or forbid short-term borrowing at the central bank.

On a more technical level, the central bank can encourage the market's development by using its transfer and settlement mechanism to assure the integrity of interbank fund flows on its books. Since the central bank would in the process be guaranteeing that the balances transferred represented good funds on receipt (i.e., could be immediately employed), it would have to consider the extent to which it wishes to be exposed to so-called daylight overdrafts in the process or wants the commercial banks involved to hold satisfactory collateral with the central bank.

b. Market instruments and infrastructure

Experience suggests that the use of competitive price auctions in marketing debt obligations may be one of the more crucial factors under the control of the central bank and the Treasury for encouraging development of a well functioning, competitive securities market. In the Philippines and Mexico, initial efforts to establish a government securities market foundered because early offerings took the form of tap issues at sub-market
rates. The primary market later developed, followed by growth in secondary market activity (relatively strong in Mexico, not so strong in the Philippines), when the Government shifted to competitive auctions.

It should go without saying that in addition, the maturity and other characteristics of the debt instrument (minimum denomination, call provisions, etc.) need to be adjusted not only to a country's particular institutional structure but also should be set so as to attract an increasing number of participants into the market. In a country experiencing substantial inflation, the market is unlikely to develop without also using bonds indexed in one way or another to retain their real value, as experience in Brazil with such bonds suggests.

With regard to market infrastructure, the central bank should take the lead, along with the Treasury, in encouraging market practices and organization most conducive to the evolution of competitive trading. When markets are in their early stages and relatively inactive, this could take the form, for example, of having the market establish a daily, computerized system of bids and offers that protect anonymity, with the market probably closing at a relatively early hour. As activity increases, trading is more and more likely to occur in the course of the day (rather than mainly just at or near the close) and the market could stay open longer. If the market is to be transparent and informative, trading should be discouraged from taking place outside "established" markets--whether in the form of exchanges, over-the-counter markets, or both--that can be monitored.

The Treasury should have as great, or greater, an interest as the central bank in developing both a primary and secondary market. For one reason, the cost of the national debt will be reduced to the degree that government securities become more and more liquid. Thus, at an early stage a joint working group of Treasury and central bank experts might well be established to encourage, monitor, and oversee market development.

c. **Official financing facility**

The availability of an official financing facility would help market development--especially in its early stages prior to the emergence of an active interbank and money market--by encouraging market-makers to take positions and carry adequate inventory needed, a necessary condition for a liquid market. Such a facility could take a number of forms depending on a country's financial structure and traditions. 1/

In India, market financing is provided by the central bank through two semi-private institutions part of whose function is to provide liquidity to the market and to stimulate market-making by other market participants. The Philippine central bank finances market activity through a broader group of

1/ See Laurens (1994) for a discussion of refinance instruments in industrialized countries.
authorized dealer banks. Poland has set up a group of primary dealers through whom open market operations are undertaken but which also function as a core group for market development and its financing through their obligation to participate in auctions, distribute securities, and provide two-way quotations.

Most countries have been moving toward use of RPs as the most flexible and convenient form of financing. In that transaction, the price at which the central bank buys the security and the price at which the seller agrees to buy it back would be set so as to yield an appropriate loan rate for the period involved, overnight or somewhat longer. The rate can be established competitively or it can be offered by the central bank based on its assessment of, and policy desires with respect to, current money market conditions.

The establishment of the RPs as an effective money market instrument would smooth the way for a broader development of the money market among private sector transactors facing temporary shortages or surpluses of funds. Ultimately, the central bank would come to have more scope for active two-way open market operations. To reach that point as soon as is practicable, the central bank would need to be sure that it administered any financing facility in such a way as to encourage market participants to seek financing elsewhere, such as from corporations with temporary surplus funds or from banks and other financial institutions.

The central bank should make it clear that availability of financing from it would depend on monetary policy, rather than strictly market, considerations. Nonetheless, in the early stages of market development a bit more consideration might be given to market needs, especially at times when market-makers have clearly made an effort to reduce their inventory in face of a financing shortage but because of the underdeveloped state of the market have been unable to find a buyer despite substantial price reductions.

In the very early stages of market development, the central bank may also wish to consider whether a relatively favorable financing rate should be offered to encourage the emergence of active market-makers. If such an approach were taken, it should be clear to the market that any implicit subsidy was purely transitional and that financing costs would be based on market conditions as soon as the market was reasonably well established.

1/ Repurchase agreements are in effect collateralized loans. But, depending on a country’s legal system, they may provide more protection for lenders. If the borrower goes into bankruptcy, the lender under a repurchase agreement may be able to sell the security and realize the proceeds immediately. If it were instead in the legal form of a collateralized loan, the lender would be delayed in receiving the proceeds for some time while the rights of the various lenders were being adjudicated.
But in considering any such temporary arrangement, the central bank should take into account the political problems that always arise with subsidies and the potential inconsistency of favorable treatment with efforts to develop the spirit of market competitiveness. It seems probable, all things considered, that market development may be most effectively encouraged through the availability of an official financing facility in one form or another at a competitive rate rather than through favorable rate treatment even for a transitional period.

d. Criteria for business relationship

In addition to establishing a financing relationship with the market, the central bank could also encourage market development by establishing ground rules for entities with which it is willing to undertake open market transactions. A number of countries conduct open market operations through so-called primary dealers who have an obligation to make reasonable bids and offers when the central bank enters the market and also a by no means unimportant obligation to bid in Treasury auctions, realistically in an attempt to win securities with some frequency and as a back-up at other times. The primary dealers in turn help broaden and liquify the market through their sales force and willingness to undertake transactions with other market participants and also by seeking out sources of financing outside the central bank. Brazil, the Czech Republic, India, Malaysia, the Philippines, Poland, and Russia are all countries which have introduced, or are in process of introducing, a primary dealer structure within the market.

In smaller countries or in markets at an early stage of development, active market-makers or even the total of participants may be so few that encouragement of a primary dealer market would be impractical and unnecessary. However, even in those instances, the monetary authority should make it clear to the market that it expects a certain level of performance if the entity expects to continue participating in transactions with the central bank. For example, entities would be expected to respond with some regularity and reasonably realistically to the central bank’s bids and offers in open market operations, and also to try to develop the customer base that would help buttress their participation and market knowledge.

When a market becomes large enough, however, there is much to be said for confining open market operations to a group of dealers, probably in practice a relatively large one to minimize the potential for charges of favoritism. The central bank may wish to designate a minimum capital for such institutions, but otherwise regulatory and supervisory responsibilities over them are best left, as noted earlier, to authorities outside the market function of the central bank. A central bank should be willing to continue undertaking transactions with a dealer so long as the institution is participating actively enough as a counter-party in open market operations. However, before the market has become relatively well established, the
central bank probably should also encourage dealers to develop their customer base since that will facilitate both open market operations and Treasury debt management.

In addition, the central bank can use its business relationship to the market to encourage participants to establish market-making standards in transactions among themselves, such as the minimum size of transaction to which a dealer is obligated when quoting a bid or offer price. As a market matures, these and similar would ordinarily come to be set by the dealers as a group through a trade association or a self-governing regulatory body.

e. Market statistics

A central bank is the natural focus for the collection and dissemination of market statistics, especially for the government securities market in view of the bank's normal fiscal agency function for the Treasury and its own open market concerns. In addition, the central bank would be the most relevant agency to assemble data on other short-term markets, particularly those in which commercial banks are the principal participants.

The process of data collection—including daily figures on positions, transactions volume, and financing by type of issue from individual institutions—should begin at the earliest stages of market development. The data should be collected on a confidential basis—that is, with assurance that an institution's data will not be revealed to the public. 1/

The figures would provide the basis for surveillance of the market by the central bank's market group. While the bank should not interfere in a market institution's internal business decisions and assessment of the market, its ability to monitor a market-maker's activity would permit it to make informal suggestions that may spur market development. In addition, of course, the availability of detailed data would help officials assess responsibility should questions about appropriate market practices arise.

As a market develops, and the number of participants and market-makers increase, the central bank should be able to publish aggregate data. This should be done as quickly as possible to enhance transparency of the market and public confidence. However, aggregate data could not be published until the number of transactors is sufficient to avoid the risk of revealing the position and business of individual firms. In any event, publication should be undertaken with a sufficiently long lag—perhaps of a week to a month depending on the particular series—to avoid market overreactions.

1/ Presumably they could be revealed to other regulatory arms of the government when there is cause, though the conditions may be a negotiable point in the data-gathering process.
f. Clearing and payments mechanism

No market functions effectively without reasonable assurance that securities will be delivered and paid for as agreed. In the very early stages of development a market may be dominated by bilateral transactions in which the parties agree on the timing of delivery and payment. Over time, however, a market will function better—and be more "user-friendly"—if time lags are generally agreed upon, perhaps varying by type of security, with the shortest-term issues having the quickest turn-around time.

Because of the central bank’s general interest in promoting the development of a secondary market and its specific interest in being able to ensure that the reserve effect of its transactions are well timed in relation to market and policy needs, the bank should take the lead at an early stage in encouraging the market to set delivery and payment standards. The terms set by the central bank on its own government security or money market transactions with the market—whether for delivery and payment today, or next day, or skip-day, or even longer—would be one key element in setting overall market norms in those area.

However, the speed and reliability of clearings and payments ultimately depend on the market’s technical capacity and institutional arrangements. Through their own actions, Governmental bodies can encourage appropriate developments within the private sector. For instance, the central bank and Treasury can work together to establish up-to-date technology in the government securities market—such as a book-entry system to record security ownership and a simultaneous delivery with payment procedure through the central bank’s deposit accounts.

The central bank can also play a powerful role in galvanizing effective and safe market clearing and payments mechanisms because of the leverage from its role as lender of last resort. Private clearing institutions will be needed as markets develop to minimize transactions costs and improve market functioning through multilateral netting procedures and through their guarantee of timely deliveries and payments. The central bank’s potential lending role—together with its and the market’s interest in minimizing the chances that it would ever be called upon to fulfill that role—gives it an important voice in ensuring that the business arrangements and practices are as safe as possible.

In particular, the monetary authority would have to be sure that clearing institutions obtain adequate credit lines from banks to backstop potential obligations from delivery and payment failures. In that context, while the central bank’s lending facility provides assurance against systemic crises, both market participants and banks should be made to understand, if they did not already, that all efforts need to be made to avoid actual use of the facility since such necessitous borrowing—whether at a penalty rate or not—could in and of itself further reduce public confidence in a market’s viability.
IV. **Conduct of Open Market Operations**

The conduct of open market operations in developing and transitional economies has of course varied with market conditions, the structure of the banking system, the degree of financial system deregulation, and the availability of government securities or private money market instruments. It has also been affected by the central bank's state of readiness, including the availability of a trained staff, an adequate statistical base, and a financial framework for guiding operations.

This section of the paper will first discuss the statistical and market information that would be needed for guiding open market operations under various operating criteria. An evaluation follows of the advantages and limitations of specific open market and open market-type instruments that have been used, or might be used, for monetary policy purposes under varying circumstances by countries at different stages in the process of market transformation. The section concludes by evaluating interconnections between open market operations and Treasury debt and cash management policies.

1. **Information and criteria for guiding daily operations**

As described in section II, open market operations can be conducted either actively by aiming at a quantity of reserves or passively by aiming at a money market interest rate or at a closely related measure of the banking system's liquidity position. No matter the particular approach to implementation of open market operations, however, the central bank would need to organize itself as early as possible to begin collecting figures on the supply of and demand for bank reserves (including clearing balances).

Data on the public's deposits in banks are particularly important in that respect because they are the key factor affecting the day-to-day demand for reserves. In addition, of course, at times when a money supply measure is serving as a strong intermediate policy guide, an up-to-date flow of deposit data would permit the monetary authority to implement changes in money market or bank reserve conditions sooner rather than later as needed to offset undesired trends in the money supply and related measures of aggregate bank reserves. However, in economies undergoing rapid growth or transition, accompanied by deregulation, the central bank would need to be especially alert to changes that affect the significance of various measures of money (narrow and broader) as the public's saving opportunities and habits are altered. This argues for also beginning to collect data on close substitutes for bank deposits early in the market development process.

But even at times when the monetary authority may not be especially concerned with money behavior, the prompt availability of deposit data will enable the central bank to make better projections over an operating period of the demand for the required reserves and/or clearing balances that serve as a fulcrum for gauging the market effect of open market operations. To
determine how many of those reserves should be supplied through the open market function, the function's staff would also have to make estimates of other factors that affect the supply of bank reserves, including such key elements as the Government's deposits, currency in circulation, foreign exchange, and float (arising from timing differences between crediting and collecting funds in the clearing and payment process at the central bank). Many of these estimates would of course require close cooperation with the Treasury at a working level.

Each day revised estimates of these factors, together with estimates of banks' required reserves and clearing or other balances at the central bank, will yield an up-to-date figure for the amount and direction of open market operations needed to maintain pressures on the money market and banking system unchanged or to tighten or ease them. The statistics put together by the open market staff would provide a basis for judging the extent to which these pressures are likely to change from factors other than open market operations. They would be the principal guide for the monetary authority's daily decision about the timing and extent of its own market intervention, with the amount depending on whether or to what extent the central bank may want to encourage or tolerate changes in money market or bank reserve conditions.

In looking to the particular reserve statistic that would be a key to daily action, the central bank may: either take a targeted level of aggregate reserves provided through open market operations (or that part represented by net domestic assets in the case of those countries which focus on that measure) and let the pressure on bank reserve positions be what it will, given banks' demand for reserves; or take a predetermined level of pressure on bank reserve positions and let the amount of reserves provided through open market operations be what it will in response to the demand for reserves.

In determining the size, timing, and direction of open market action, the accuracy of the reserve estimates, which are always subject to some uncertainty and to revision, would in practice need to be judged against incoming evidence from the interbank or money market about emerging pressures as seen in interest rate behavior. Interpretation of factors behind money market rate movements should be aided by the central bank's continuing contacts with the market. Traders from the central bank's open market function should be continually speaking with market traders in an effort to understand the background factors influencing ongoing market conditions and also to enable monetary policy decision-makers to better assess market psychology.

Apart from the role of the money market rate, as well as the market's tone, in helping to judge the accuracy of statistics on factors affecting bank reserves, a short-term market rate, in particular an overnight rate, may also usefully serve as the primary guide for day-to-day open market operations once the interbank part of the money market becomes sufficiently
well developed. An overnight money market interest rate has a technical advantage over a measure of bank reserve pressures (such as excess or free reserves) as a guide since it would permit the central bank automatically to accommodate changes that may occur in banks' demand for excess or free reserves, given market rates. If such shifts in demand were not accommodated, they could adversely affect growth in money and bank credit, holding it back perhaps pro-cyclically when there was an unexpected upward shift in the demand for free or excess reserves and accelerating it when there was a downward shift.

Use of a money market rate as a day-day operating guide would not lessen the need for prompt collection of statistics on factors affecting the supply of and demand for reserves. Given the generally close relationship between money market rates and the degree of pressure on bank reserve positions, the estimate derived from those statistics of impacts on free reserves (the difference between the reserves provided through open market operations and the required reserves or clearing balances demanded by banks) in the absence of open market operations, would provide the initial starting point for determining the likely amount of open market operations needed during a particular operating period. Without an adequate statistical base, the central bank would be greatly hampered in its ability to judge whether daily money market rate movements are or are not temporary and would be at greater risk of providing reserves more suited to the market's convenience than to serve the central bank's own monetary objectives.

The precise day-to-day operating target used in practice in the developing and transitional markets examined, and the degree of flexibility in their use, are not always clear from available information. Nonetheless, it would appear that a short-term interest rate or some measure of bank liquidity pressure represents the predominant day-to-day policy guide in those countries where markets have attained some degree of maturity.

Bank liquidity or reserve projections are apparently a key guide to operations in the Czech Republic, India, Indonesia, Mexico, Malaysia, and Poland. Poland employs a free reserve measure, while the Czech Republic uses banks' excess reserves. In the latter country the discount window is effectively closed, as noted earlier, with the discount rate chiefly serving as an indicator of the central bank's monetary stance. In the case of India, interest rate liberalization in recent years has led to a shift in operating targets toward a measure of bank reserve pressure and away from an earlier emphasis on maintaining orderly conditions in the market for government securities to facilitate debt management.

Other countries appear explicitly to target on a short-term interest rate. Thailand, the Philippines, and Brazil employ an interbank rate. Egypt, which does not have an active interbank market, aims at a Treasury bill rate.
This rather general focus on what might be broadly termed money market conditions (whether represented by an interest rate or bank reserve pressures) as a day-to-day operating guide is found despite use of differing intermediate policy guides across countries. Net domestic assets have been taken as an intermediate guide in Poland and Mexico; base money in the Philippines and Brazil; M2 in the Czech Republic and Indonesia; M3 in India and Malaysia; and the foreign exchange rate in Egypt. Thus, central banks in emerging markets that have reached a certain level of competitiveness and flexibility have--like central banks in major markets--generally decided to conduct open market operations on a passive basis, leaving themselves with considerable flexibility in affecting the degree of pressure on the banking system and the basic cost of liquidity in the economy.

2. **Instruments for open market-type and open market operations**

In utilizing specific market instruments to achieve their operating objectives, the experience of developing countries and economies in transition has depended on a variety of factors specific to their individual circumstances. These have included the availability of government securities, the relative size of primary and secondary markets, the existence of a competitive market for interbank funds, and more generally the extent to which Governments have been willing to deregulate and rely on market processes for encouraging and channelling saving into productive investments.

Without a developed secondary market in securities, central banks would be, and have been, limited to open market-type operations in the primary market, such as auctioning newly issued securities to absorb reserves or auctioning central bank credit to provide reserves. Instruments that have been and might be used in the absence of suitable secondary markets and a sizeable government debt will be evaluated first in this section of the paper.

As has been noted, they usually represent the initial steps that can be taken in the evolution toward use of more fully flexible open market operations in policy implementation. In practice, they are best accompanied by actions discussed in section III if the market participants are to be made aware of the central bank's interest in furthering the development of markets in an effort to achieve greater flexibility in operations. A discussion then follows of various instruments that can effectively be utilized once active secondary markets have developed and useable collateral is more generally available.

a. **Open market-type operations**

A much used open market-type operation involves the issue of either new Treasury or central bank securities into the primary market by the central bank for monetary control purposes to absorb excess liquidity. The
Czech Republic and Ghana employ both. Egypt auctions only Treasury bills to absorb reserves, but also mops up liquidity through commercial banks' placement of time deposits directly with the central bank. 1/

The Philippines central bank has also used issuance of Treasury securities and sale of its own bills in the primary market as monetary instruments, but use of both instruments created some market confusion and difficulties as will be briefly discussed later. In Indonesia, a country without government debt, the central bank, as noted earlier, auctions its own bills as way of absorbing excess liquidity and purchases bank-endorsed paper to provide reserves to the banking system.

If the central bank offers a new Treasury security, it should be considered a monetary operation, in contrast to a governmental debt management operation, only if the incoming funds are not available to the Government for spending. This can be accomplished in several ways, one being to cede to the central bank control over an equivalent amount of the Treasury's deposit balance at the bank. However, the cleanest approach is to set the funds aside in a special account that is created purely for monetary policy purposes and cannot be employed to finance spending by the Treasury or the central bank for that matter, under any circumstances.

Such an account would ensure that bank reserves were "permanently" reduced by the operation. The Treasury could not increase reserves by drawing down the balances. On the other hand, if the central bank had overestimated the reserve surplus when it initially issued the securities and subsequently needed to provide reserves temporarily, it could buy the securities back before maturity and credit banks' reserve accounts, leaving the special account balance unchanged.

Such repurchases before maturity, perhaps followed by subsequent resales, would have the ancillary advantage of helping to create the basis for a secondary market among private sector participants. Secondary market trading in such securities as a means of redistributing reserves around the banking system and developing an active money market should be encouraged as a step toward further market development.

A special Treasury account set up in connection with these open market-type securities should receive interest at a market rate. An explicit interest rate could be set for the account based on market conditions. However, if the central bank distributes basically all of its net earnings to the Treasury, no equivalent of market interest would in any event be received by the Government in due course and an explicit rate for the account would be redundant.

1/ See Quintyn (1994) for a discussion of the use of government securities versus central bank securities in developing countries.
The drain on Government revenues from sale of the special monetary policy security to the public is roughly the same as occurs when the central bank sells any security from its portfolio, auctions new securities of its own, or reduces its loans to the banking system. Thus, use of the special security would not make Treasury revenues less than they otherwise would be, assuming that the central bank does not as a result alter its monetary target from what it otherwise would be.

Since issuance by the central bank of its own securities to the public for reserve absorption purposes is no more or less costly to the Government than offerings of special Treasury issues for monetary policy purposes, the choice between the two depends on institutional and market considerations. A central bank's own security can be a very useful, if not necessary, open market-type instrument in countries, such as Indonesia, where there is no government debt or in other countries, such as the Philippines in the first part of the 1980's, where the central bank does not have access to sufficient government debt.

However, experience in the latter country illustrates some of the difficulties in a situation in which both governmental and central bank market instruments co-exist. The principal problem would appear to be public confusion about the relationship between the two. In the Philippines, the Government came to view use by the central bank of its own instruments as complicating interest rate and debt management policies by encouraging market segmentation in a thin over-all market. The development of an active government securities market was apparently being retarded, rather than aided, by large-scale issuance of the central bank's own bills.

Moreover, the central bank was taking large losses from other operations (such as foreign exchange transactions and the restructuring of weak commercial banks) that were being exacerbated by payment of interest on its own securities. Thus, the credibility of the central bank as a viable institution for anchoring the financial system was coming under question. In the end, by 1993, the central bank was restructured and the new bank received a broad portfolio of Treasury securities to facilitate market operations--but with operations in such securities confined to the secondary market rather than being undertaken in the primary market.

Experience in Brazil, however, contrasts with the Philippines. The over-all market in the former country is relatively broad, and central bank securities issued for monetary control purposes have traded well along with government securities issued for debt management purposes.

Open market-type operations in the form of issuing Treasury or central bank securities in the primary market are most practically used when excess liquidity is piling up in the banking system--for example from large capital inflows. The securities issued might also be employed to adjust to the ebb and flow of liquidity needs in the course of a year as the central bank adjusts issue volume and, conceivably, buys back before maturity.
Still, they do not provide the same flexibility as open market operations in the secondary market for coping with fluctuations—unexpected as well as expected—in liquidity and the demand for bank reserves. For one thing, the central bank’s open market function would, in the absence of an active money and interbank market, still be deprived of the ongoing information about actual and emerging liquidity conditions that is conveyed through ongoing competitive interest rate determination. Thus, it would be more difficult for the monetary authority to plan the size and timing of reserve absorbing operations, and the actual outcome of operations may be more subject to the vagaries of a primary market bidding process rather than to the central bank’s prior intentions about a particular interest rate or a particular amount of reserves.

However that may be, such open market-type operations obviously do not provide the reserves needed by the banking system over time to support expansion in money supply and bank credit for economic growth. For that purpose, countries without, say, sufficient foreign exchange inflows have turned to such market-type instruments as credit auctions in the absence of a developed secondary market in government securities or interbank instruments. Of the countries surveyed, these have been used at one time or another and to one degree or another by Mexico, Russia, the Czech Republic, and Tunisia. The regular purchases of SBPU’s by Indonesia might also be viewed as a form of credit auction on a daily basis.

The auction of credit through the central bank’s open market function differs from credit made available through the discount window in crucial ways. First, a credit auction can be used by the central bank to control the amount of reserves to be supplied while the banks, through the bidding process, determine the interest rate. At the discount window, the rate is normally set by the central bank and the amount loaned, and therefore the amount of bank reserves, would be at the initiative of the banks, not the central bank. Second, the central bank might be able to resell paper acquired in the auction at its initiative into a secondary market; loans at the discount window would, by contrast, normally be repaid on a schedule or at the initiative of the borrowing bank. In general, in contrast to use of the discount window, a credit auction gives the central bank more initiative on the timing, amount, and price at which reserves are supplied and also could provide some additional flexibility for draining reserves once the instruments are created, though Indonesian experience suggests that it may be practically difficult to develop a secondary market in such bank paper.

Credit auctions have a useful role to play in the transition toward more flexible markets in part because they can help introduce market-like processes at an early stage. However, at times, credit auctions appear to have impeded the development of an active interbank market by encouraging banks to look directly to the central bank in managing its liquidity needs.

1/ See Saal and Zamalloa (1994) for a discussion of credit auctions in economies in transition.
On the other hand, in a country like Malaysia where an active interbank market has evolved, the central bank has been able to function in the market without drying it up. Indeed, the Malaysian central bank employs direct borrowing and lending with banks on a bilateral basis as a principal instrument of monetary control.

While credit auctions and other means of acquiring private debt may be useful monetary tools for providing reserves in countries without a significant floating supply of government debt, reliance on them does raise certain questions about the liquidity of the central bank’s balance sheet and the institution’s stature with the public as a truly safe guardian against both systemic risk and inflation, as noted in section III.

Admittedly, confidence in the central bank and the Government is based more on past policies and an assessment of their current posture than on balance sheet structure. Nonetheless, any questions about balance sheet structure might be lessened in countries without a significant government securities market if expansionary open market-type operations were conducted at least in part in special Treasury debt issues offered for such purposes. Special Treasury obligations have been utilized to absorb reserves, as described earlier. A different kind of special Treasury obligation with certain special features could also be employed to expand reserves.

Such an obligation would, once created, remain on the asset side of the books of the central bank to support growth in the banking system’s reserves if the central bank were given the right to transfer to private banking institutions an associated special Treasury deposit liability. The deposit liability, which would not be controlled by the Treasury, would be created simultaneously with the special security at the time when the central bank wished to expand reserves. At that point, the deposit liability would be transferred to the banking system either through an auction of a predetermined amount or by a distribution based on, say, bank size.

An auction would be the preferable approach—in effect an open market-type operation in the form of a primary market auction of bank reserves conveyed via Treasury deposit liabilities. Whether auctioned or not, the special Treasury deposits would be priced to yield a market return to the Treasury and would determine the interest rate on the special Treasury security held by the central bank. This market return would represent seignorage on money creation that the Treasury would have received in other circumstances if the central bank had been able to purchase securities in the open market (thus in effect retiring debt and saving the interest cost).
However, in the case of the special obligation, the seignorage would in effect be paid by private banks holding the deposit liability and not by the central bank. 1/

The interest rate should be based on a short-term maturity of, for example, three months or so. Banks would have the opportunity to bid for the Treasury deposit liabilities every three months; or, as an alternative to reduce uncertainty for the banks, the central bank could reset the rate based on market conditions and give existing liability holders the right to roll over at that rate.

Both the special issue and deposits could be marketable, though secondary market transactions should probably be limited to those consistent with the instruments' basic reserve-supplying function. Banks could sell the special deposits to each other, thereby redistributing existing reserves; and they would become one instrument, among others, in a developing interbank market. 2/ But it would seem to be undesirable in practice for the central bank to also engage in secondary market transactions with banks in the deposit—for example, to buy them back to absorb reserves. Since the basic purpose of creating the special deposit would be to provide permanent reserves backed by highly creditworthy governmental securities, transactions in the special deposits to reduce reserves would tend to confuse the issue.

Conceivably, the central bank could also sell the special debt instrument into the market to mop up excess reserves, but that too should be kept to a minimum practice for the reason noted above. However, the instrument could well be used as collateral to absorb reserves temporarily through RRPs without jeopardizing its fundamental market role.

The Treasury would of course need to guarantee payment of interest on the security for it to serve as a highly liquid, safe instrument. Otherwise, since the interest on the issue would be dependent only on banks' ability to pay for the special deposit, the security would be no more creditworthy than ordinary bank paper and would not serve to enhance the central bank's credibility.

1/ The potential negative real impact on the government's budgetary position should a bank with a special deposit fail would be no different from the situation in which the central bank instead held such a bank's commercial paper. In any event, the special deposit would in the end be taken over by another banking institution that may acquire part or all of a failed institution or the deposit could be returned to the central bank and included in a subsequent reserve supplying auction of such deposits.

2/ However, banks should be limited in the amount of special deposits they can hold to some relatively small percentage of their total liabilities in order to ensure that the deposits do not drift toward weaker banks that would not be considered good risks in the interbank loan market.
b. Flexible open market operations

As their economies expand and markets mature, most countries have tended to place more emphasis in policy implementation on use of highly flexible open market operations in the secondary market. Of the countries surveyed, Brazil, the Czech Republic, India, Malaysia, Mexico, the Philippines, Poland, Russia, and Thailand have, with varying degrees of completeness, moved in that direction.

Open market-type operations have often continued to have some role, however, with the extent depending in part on the state of secondary market development. Brazil, Malaysia, Mexico, and the Philippines are examples of countries operating policy with a blend of open market-type and open market instruments.

In each of these cases, however, secondary market transactions—mainly in the form of RPs and RRPs or in the interbank market directly with banks—appear to be a key instrument of monetary control, if not the principal one. Thailand and Poland also for a while relied more or less entirely on RPs in the secondary market to implement policy, abjuring primary market operations. Poland, however, recently introduced outright operations as the secondary market developed further while the Bank of Thailand is now auctioning its own bills. The heavy reliance of Thailand on RPs for implementing monetary policy has recently been reduced with the introduction of auctions of central bank's own bills.

With the exception of Malaysia, these countries generally have developed a fairly active government securities market that has facilitated the transition toward greater use of open market operations. The authorities in Malaysia, faced with insufficient governmental securities for the full scope of operations, employ an auction system to allocate Government deposits among commercial banks as the principal day-to-day instrument of monetary control.

Other countries have developed operations in the private market. Indonesia has taken steps to develop a secondary private market, but thus far it has not yet moved significantly beyond open market-type operations in the primary market for policy implementation. However, the operations carried out are quite flexible and attempt to replicate the functioning of a secondary market.

Bank Indonesia absorbs reserves by auctioning its own issues on a daily basis to the market and provides reserves by purchasing various forms of banks' paper in daily auctions. Because the secondary market has remained thin for a variety of reasons, including the wide diversity of issues with different risk and the absence of a requirement on market-makers for minimum bids and two-way quotations, the central bank has been forced to act as a middleman between borrowers and lenders through adjustments in the relative size of its daily auctions. The awkwardness of this technique and the
absence of a well functioning secondary market means, however, that policy implementation is quite complicated. This may at times have contributed to difficulties in achieving policy objectives and effective coordination with other factors and instruments affecting the bank reserve base (such as capital inflows and foreign exchange swaps). Though of course, even with well-developed secondary markets, countries often have difficulties in coordinating operations to balance interest rate and exchange rate objectives.

In the transition to open market operations as a major policy instrument, RPs in government securities are clearly the most useful and prevalent type of operation. As compared with outright operations, they interfere less with the further development of secondary market trading in outstanding securities since they essentially provide temporary financing of reserve shortages or surpluses and do not directly influence the basic supply of and demand for the underlying security that serves as collateral. 1/ More positively, they serve to enhance the liquidity of the underlying securities and in that way help to develop a more active secondary market with enough depth and breadth to accommodate outright transactions by the central bank. While RP transactions are generally quite short-term, the underlying collateral would comprise both longer-term and short-term securities, thus adding liquidity to all sectors of the market. 2/

The use of RP's with a short maturity should also make it clear to the market that the central bank is encouraging participants to develop as many alternative short-term borrowing or lending sources as possible. The development of what is in effect a money market would help facilitate the redistribution around the banking system of the aggregate reserves supplied by the central bank--obviously a necessary function if open market operations are to replace the less impersonal and more difficult to administer one on one relationship between the central bank and depository institutions.

1/ The discussion here is confined to RP transactions for domestic policy purposes with domestic securities as the underlying collateral. In the absence of sufficient domestic securities, foreign exchange swaps can also be employed to affect domestic liquidity as, in effect, a substitute for RPs. It is another matter, however, if swaps or outright foreign exchange transactions are used for purposes of influencing the exchange rate. The central bank's domestic open market operation would then be differently affected depending on whether it was being guided by a bank reserve aggregate or its net domestic assets. If the latter, it would not "automatically" sterilize the domestic market effect of a foreign exchange operation; if the former, it would.

2/ The buyer of the security in an RP transaction would, of course, need to be alert to the greater potential for price variability in longer-term securities relative to short-term in ensuring that an adequate margin was maintained against the chance that the seller would fail to repurchase.
Even apart from their value in contributing to market development, RPs and RRPs can be expected to be the dominant form taken by open market operations, as country experience has shown. They are ideally suited to offsetting the short-term fluctuations in factors affecting bank reserves that are the major influence on day-to-day market operations. Because the maturity of RP's can be set by the central bank, they can be timed automatically to reverse themselves as circumstances change. The central bank could also permit them to be withdrawn before maturity if it wished. That would be most appropriate when there is particular uncertainty about the actual size of operations that may be needed; it would be a way of letting the market itself automatically adjust should, for example, a reserve surplus (that the central bank is absorbing through reverse repurchase agreements (RRPs) turn out to be less than expected.

Because they can generally be done in much larger size than outright transactions, RPs are also useful for offsetting large shifts in liquidity conditions that might be caused, for instance, by a wave of capital inflows or outflows. In that case, maturities would be longer than the maturities of up to one week that are most useful for smoothing out the money market. Even when maturities are short, though, the central bank can continuously roll over the transaction as needed to meet its liquidity objective.

Experience with use and maturity varies among the countries examined, but short-term operations tend to dominate. In Brazil, where RP's are taken to be the main instrument of monetary control, operations are undertaken through informal auctions on a daily basis, with maturities generally overnight. Mexico and Poland also undertake relatively frequent operations with short maturities. Thailand employs an elaborate auction process twice a day for RP and RRP transactions, with maturities ranging from overnight to six months, though the most popular maturities are at the short end of the market. Maturities appear the longest in the Philippines, where RRPs are employed actively to absorb liquidity, with maturities commonly between one week and one month and with a maximum maturity of one year. It might be noted in passing that although the central bank in Argentina announced suspension of rediscounts and outright open market operations in shifting toward a currency board-type arrangement for monetary policy, it continues to use RP's and RRP's to smooth out day-to-day market liquidity conditions.

Outright purchases and sales of Treasury securities in the secondary market are also used in most of the countries examined as their secondary markets have developed. They are often used, as in Brazil, to provide or indeed absorb reserves on a more permanent basis. In India and the Philippines, outright transactions are considered to be an important instrument of monetary control and are undertaken on a daily basis—in Treasury bills in the case of the latter country.
In general, when secondary markets are in the early stages of growth and trading is comparatively thin, outright transactions by the central bank run a high risk of dominating the market and impeding its further development. This is particularly the case for longer-term market sectors.

As explained in the preceding section, sales outside the short-term area of the market might well be avoided in an effort to keep market risk, from the viewpoint of the participants, to reasonable proportions. And excessive purchases in the longer-term area risk weakening the market's incentives to develop a broad customer base, not to mention diluting the market's capacity to serve as an independent source of information about attitudes and expectations for the central bank. Thus, outright purchases and sales of securities should generally be centered on the short-term sector of the Treasury market where there is normally a more continuous and sizeable volume of activity.

In all transactions, outright or RPs, market development would be most encouraged by use of a competitive price bidding technique involving all eligible market participants. More limited go-arounds of a few participants may be useful at times, but they tend to be viewed as unfair and do little to enhance a broadening of the market.

There are both advantages and disadvantages to indicating the size of the operation contemplated by the central bank. The chief advantage is that markets are given a key piece of information for pricing and sizing their offers or bids. The main disadvantage is that the central bank loses the flexibility to adjust the size of its operation on the basis of market response, although it can, as debt managers often do, reserve the right to vary the aggregate size within a small range (such as ten per cent of the initial offering).

On balance, it can be argued that the amount should be indicated for outright transactions, which would in any event probably be relatively moderate in size and aimed at provision of reserves over the longer run. For RP transactions, on the other hand, the central bank may not wish to indicate an operation's size in advance to the market. Since the average interest rate on such transactions would generally be a closely watched indicator of the central bank's current policy stance, the central bank may need to leave itself sufficient flexibility to adjust transaction size so as to avoid the potential for an interest rate outcome that might mislead market participants. Moreover, on more technical grounds, the central bank may also conclude that the intensity of market response to the proposed transaction would in some circumstances be a better measure of market shortages or surpluses than the bank's own statistical estimates.

Even if the amount bid or offered by the central bank in an RP transaction is not indicated in advance to the market, the approximate size—based on current statistical information and expected market performance—should be first decided internally by those in the central bank...
responsible for policy (as should also be the case for outright operations of course) before the manager of the open market function is given permission to enter the market. This would be desirable to ensure appropriate lines of responsibility within the policy process. The manager could be given the option of varying the amount within a range, but substantial variations should require a further policy decision.

In the interest of transparency, the results of an open market transaction—or indeed an open market-type transaction—ought to be announced to the market as promptly as possible. Depending in part on the technique of the offering, this would include the amount taken, the average price, and the stop-out. Especially in the early stages of market development, a central bank whose operations are transparent may acquire more of the public stature that would enable it to spur, partly through moral suasion, those developments in the micro-structure of markets that would increase activity and the market’s reliability as a source of information to policy-makers.

3. **Government deposits and debt management**

Governmental decisions about debt management and use of its deposit balance have a number of implications for open market operations, and vice-versa. They can excessively complicate or facilitate operations. This is well recognized, of course. In all countries surveyed the Treasury and central bank work together on these issues, though with varying degrees of tension and power distribution. On purely debt management decisions, the Treasury in most cases makes the final decision and the central bank serves as fiscal agent. In areas that have a direct effect on the bank reserve base, the central bank normally has a stronger input.

The particular structure of the working relationship between the Treasury and the central bank differs in accord with the traditions and financial history of the country. In India, for example, the Reserve Bank has acquired and held in its portfolio ad hoc Treasury bills at a sub-market interest rate to finance the Government deficit—a practice that is planned to be phased out in a couple of years—and have made offsetting sales of other instruments bearing market interest rates at its discretion. In Brazil, the Treasury manages the debt in consultation with the central bank; with regard to debt issued in the form of notes (NTNs), the Treasury sets the over-all size and the central bank decides on the amount to be kept in its portfolio, with the rest auctioned. China is moving toward a new debt management system to help break the direct debt financing relationship between the central bank and the Government. In the new approach, the Finance Ministry would be responsible for issuing bonds, but the central bank would take responsibility for placing them through organizing a national underwriting syndicate.
No matter the particular form of the operating relationship between the Treasury and the central bank, open market operations will be most effective when the central bank has control over factors that affect the reserve base of the banking system. Thus, when the central bank does in effect underwrite Treasury debt, the bank would have to be free to sell or auction the debt into the market as required to meet monetary policy objectives. It would be most desirable, though, if the debt were sold directly into the market by the Treasury, avoiding any potential conflict between debt management and monetary policy needs.

Moreover, such sales should be in the form of auctions, as is the case for most countries, to help in the development of a competitive and deregulated market system and also to avoid pressure on the central bank to hold policy on an "even keel" for the purpose of facilitating primary market issues when offered at a predetermined rate. Market-makers or dealers should be required to make reasonable bids in the auctions as part of their market function and if they are to retain their role as counter-parties with the central bank in its open market operations. As noted earlier, this would help further secondary market development as the market-makers in turn sought to expand their customer base.

From the perspective of day-to-day open market operations, it is particularly important for the central bank to be able to influence, if not control, the Treasury’s operating cash balance with the bank. It is highly unusual, however, for a central bank to be given substantial discretionary control over Government deposits. Notable exceptions are the Bank of Canada which has the right to transfer Government deposits between itself and commercial banks; the Bank Negara Malaysia, which as noted earlier auctions such deposit to banks as an instrument of policy, and the Bundesbank, which has a veto on the Government’s ability to hold deposits outside the central bank.

The problem of coordination arises, of course, because variations in the Government’s balance held with the central bank affect the reserve base of the private banking system. Open market operations in the money market can be and are employed by central banks as needed to offset the impact on the Treasury balance and hence bank reserves from variations in Treasury receipts and expenditures. However, sometimes there may not be sufficient collateral readily available for the size of such operations. Thus, it is often simpler if the Government keeps its balance at the central bank around some agreed operating level to the extent practicable and draws on or redeposits funds with commercial banks to offset the impact on the balance of variations in tax receipts and expenditures. Such an approach would have particular appeal when the money market is not very highly developed, but it is also the approach followed in the U.S.

The Treasury’s operating cash balance with the central bank can also serve as a day-to-day monetary instrument for hitting reserve or money market rate objectives, as is the case in Canada. But without a clear
agreement between the central bank and the Treasury, the instrument can become a two-edged sword and lead to market confusion. Agreement is needed about its use, for instance, to avoid the possibility of conflicts between the Treasury and the central bank—or of, even worse yet, the emergence of a market belief that the central bank cannot control its policy on an objective basis should variations in the cash balance happen to lead to an easing, or avert a tightening, of money market conditions at a time when a Treasury financing is in the market.

In general, open market operations will function most effectively when the Government aids by, and the public believes in, a clear division between debt management and monetary policy operations. Markets in a deregulated, competitive environment will develop most effectively when the division between monetary policy operations and the government’s debt or cash management policies is very clear and well adhered to.

With regard to the Treasury’s operating cash balance, this would involve either agreement to neutralize its monetary effect or to delegate substantial control over it to the central bank. With regard to debt management in general, this would involve use of public auctions in one form or another as the basic technique for primary market financing, leaving the central bank free to determine monetary policy on purely economic grounds. For coordination purposes, and given the central bank’s expertise in markets and usual role as the Government’s fiscal agent, in virtually all countries debt management decisions are made with an ongoing input, both informally and through formal committee structures, from the central bank and also often from active market participants.

V. **Concluding Observations**

1. There is much to be said for establishing the basis for the central bank’s use of open market instruments as soon as possible. Deregulation of markets domestically together with the widening impact of globalization make it almost impossible for any country in the process of growth or transition to effectively employ direct instruments of monetary control for long without adverse side-effects. While the central bank cannot transform its own modus operandi much ahead of ongoing changes in market structure, it can and should encourage those changes in market structure that would make it better able to conduct open market operations. That should also help, through example supplemented by moral suasion, to accelerate the transition of domestic markets as a whole in the direction of greater consistency with major world markets.

2. While this paper has not undertaken the econometric research that would be required to determine whether countries with open market operations perform economically better than those without—probably a near impossible task in any event given all the variations in circumstances that would need to be allowed for—experience suggests that in practice countries act as if
they have little choice except to begin the transition toward greater use of market instruments in monetary policy. Both emerging and transitional countries have taken steps in that direction consistent with the market's stage of development, though some have lagged markets and others have more actively attempted to lead them.

3. Countries where central banks appear to have lagged in adapting policy instruments to market developments, or even lagged in encouraging market deregulation, have found that they were hampered in meeting their own policy objectives. This has often been a spur to official action to hasten the transformation process by adapting market instruments for policy implementation in line with market evolution or to speed up the market deregulation process itself in order to make such instruments more useable and effective. Indonesia in the early 1980's took the latter approach. The restructuring of the Philippines central bank in the early 1990's is more of an example of the former, as it shifted away from monetary policy intervention in the primary markets to sole use of developing secondary markets.

4. Of course, the availability of market instruments to the central bank is no guarantee at all that monetary policy or the country's economic performance will be continuously satisfactory. Recent experience with Mexico is only one of a number of cases in point. In that country active secondary markets had developed, and the central bank could implement policy through highly flexible operations in those markets as well as through use of open market-type instruments in the primary market. Clearly, an arsenal of open market instruments in tune with the evolving market structure should be considered as at most a necessary condition for an effective monetary policy—certainly not a sufficient one.

5. Most countries in the process of moving away from use of direct instruments of monetary control to use of market instruments have also begun to make the complementary adjustments in reserve requirement structure and in discount window and rate administration that are needed to make market operations more effective in policy implementation. With regard to reserve requirements, this has involved a gradual reduction in reserve ratios to reduce the implicitly greater tax on the banking system relative to other financial institutions, but for the most part reserve ratios appear to remain at "binding" levels that permit banks' reserve balances to better serve as a fulcrum for policy implementation and a signal to policy-makers. The discount window, insofar as very short-term adjustment borrowing is concerned, has come to be administered more restrictively to be consistent with stress on policy implementation through reserves provided by open market operations. But it has for the most part remained available as a safety valve, so that its use may reflect the degree of pressure on markets and help smooth the process of market adjustment. In some cases, such as Mexico, reserve requirements have been eliminated and the discount window effectively closed except for emergency lending.
6. It is not inconsistent with experience of countries to suggest that a complementary mix of instruments may best suit countries with emerging markets or in process of transition, rather than exclusive reliance on open market or open market-type operations. In those countries markets are still in the process of formation and generally are not especially robust. Moreover, the markets and the banking system may be prone to sudden surges of liquidity excesses or deficiencies, resulting from shifts in international capital flows and in domestic psychology that unfortunately may be generated by uncertainties which accompany rapid transformation of a country’s economy and financial system. The central bank in the circumstances would generally be well served by a balanced set of instruments—with open market instruments playing an increasingly important role as markets develop—to cope with contingencies that threaten to overwhelm markets and their capacity to act as a direct conduit for policy operations.

7. The process of transformation to effective use of open market instruments in policy implementation usually involves two stages of market development. In the first, secondary markets are weak or virtually nonexistent, and the central bank implements policy through open market-type operations in primary markets. In the next stage, secondary market activity has evolved to the point where the monetary authority can increasingly employ the more highly flexible operations in those markets either through RFs or outright transactions. Many central banks have continued with a mix of primary and secondary market operations as markets have matured. Others have shifted to use of secondary market operations only, as is done by central banks in major developed markets.

8. The initial transition from direct monetary instruments to open market-type operations in primary markets has been accomplished by virtually all countries examined as they began to deregulate markets. That transition has been relatively simple in part because the market is not, and need not, be significantly larger than the auction in which the central bank plays a key role. But the next step in the transformation of the central bank’s policy instruments—the step to use of highly flexible open market instruments in secondary markets—has proven to be more difficult since it requires substantial private market activity independent of the central bank.

9. To have well-functioning secondary markets, the volume of activity must be quite large and must develop almost wholly within the private sector itself. That depends on a host of factors largely outside the central bank’s control—such as the country’s stage of economic development or transition—but also on some that it can at least strongly influence—such as the legal, regulatory, and payments infrastructure needed to inspire confidence in potential market participants. Steps that the central bank can take to help encourage a positive market infrastructure are discussed at some length in section III. A central bank’s open market-type operations in the primary market should also be viewed as a way station toward operations
in the secondary market and designed, therefore, to minimize continuing reliance by individual institutions on the central bank for adjusting their liquidity positions.

10. It is difficult, however, for the central bank to accelerate development of the secondary market by undertaking actual transactions in that market, especially outright transactions, in the early stages of its development. If attempted in a thin market, the central bank’s transactions, particularly if sizeable, risk dominating the market and forestalling its development. In practice, the central bank’s open market operations in secondary markets would need to remain a relatively minor part of total market volume if the open market instrument is to be truly flexible in its use—that is, permit the central bank to enter the market on either side on a more or less continuous basis, with size and timing at its own initiative and with the interest rate determined competitively. RPs and RRPs would appear to be the most effective route for encouraging further market development through operations since they add to the liquidity of the underlying securities collateral and do not directly interfere with the market supply of and demand for the securities.

11. An active secondary market is most likely, and easiest, to develop in government securities, and at the short end of that market. Assuming the Government and central bank are pursuing a stable financial policy, such a market has the advantage to the central bank and private participants of being essentially free of credit or default risk, permitting the securities to be readily traded and used as collateral. Absent a sizeable outstanding volume of such securities, however, the central bank would have to conduct open market operations in short-term private debt. For those purposes, development of an active interbank and money market is crucial.

12. Indeed, it is crucial for the central bank to attempt to develop an interbank market in any event, whether or not a government securities market exists. The monetary authority can help market development by, for example, adjusting its policy instruments to discourage banks from interacting with the central bank rather than with each other and taking other steps to undergird market structure such as encouraging a reliable payments mechanism. Once developed, the market can be employed for policy operations. But equally or more importantly, it would provide the central bank with signals about the degree of liquidity pressure in markets, which are needed to help in interpreting the significance of incoming statistics on factors affecting bank reserves for the amount and timing of open market operations.

13. There are, nonetheless, risks for a central bank if it relies excessively on operations in private money market paper, presumably mostly bank paper, to support expansion of the monetary base needed for economic growth. It, of course, may be forced to do so in the absence of a sizeable open market in government securities or a sufficient and growing volume of foreign exchange. But the risks are that the central bank’s portfolio may
become quite illiquid and that over time, as a portfolio of private paper builds up, the market may come to believe that the central bank is no more stronger than the private sector itself. The market credibility and stature of the monetary authority might well then be reduced, and the risks of financial crises heightened in some degree—though, admittedly, the basic influences on a central bank’s stature are its past policy record, the credibility of its current leadership, and assessment by the market of the Government’s basic commitment to a stable financial policy and to support of the central bank.

14. In the absence of an active government securities market, use of a special Treasury debt issue to support expansion of the monetary base might be considered as a supplement to private paper to strengthen and diversify the central bank’s market portfolio. Open market-type operations for monetary policy purposes through primary market auctions of Treasury issues or of the central bank’s own obligations have been employed by a number of central banks in developing countries to absorb reserves. As explained in section IV, a special Treasury issue can also be employed to provide reserves for growth—substituting in some degree for the acquisition of private paper—by giving the central bank the authority to auction to banks the special Treasury deposit that would be created along with the special debt issue. In the end, the central bank’s asset portfolio, with the special debt issue guaranteed by the Government, may appear more creditworthy to the market.
Use of Market-Type and Open Market Instruments

This appendix presents information on the use of market-type and open market instruments in a sample of fifteen countries as of Spring 1995. The sample includes developing countries and economies in transition. Information is organized in country tables. Each table consists of seven columns describing particular characteristics associated with use of market instruments. The first three columns are closely related, as they describe the use of existent market-type and open market operations in each country.

The first column (Instruments), identifies market-type or open market instruments that are currently used by the central bank. The second column (Purpose and Use of Instrument), indicates the strategic function of each market instrument. The third column (Operating Procedures), shows how these instruments are utilized in practice (frequency, maturities, pricing mechanism, etc.). The fourth column (Structure of Markets), depicts the most salient features of existing markets or markets where the central bank intervenes. The fifth column (Decision Making Process), indicates principal monetary policy indicators (intermediate and short-term operating targets), structure of policy decision making regarding market instruments, and decision making process. The sixth column (Other instruments), describes the setting of other instruments at the disposal of the central bank. The seventh column (CB-MOF relation on debt management), identifies the relationship between the central bank and the Government.

1/ Market-type instruments refers to those instruments that are used at the initiative of the central bank, are operated at market prices and, are employed in the interbank or primary markets for liquidity management purposes. These instruments include: credit auctions; voluntary placement of deposits at the central bank at market conditions allocation; and sales of securities (central bank of government) in the primary market.
Table 1. Argentina: Market-Type and Open Market Instruments

<table>
<thead>
<tr>
<th>Instruments</th>
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<th>CB-MOF Relation on Debt Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Primary issuance of T-bills, Bonex (dollar denominated bonds), and other government instruments.</td>
<td>1. Not used for monetary policy purpose.</td>
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<tr>
<td>2. &quot;Pases&quot; in domestic and foreign currency.</td>
<td>2. Argentine equivalent to RPs and RRPs; to influence market liquidity and interest rates.</td>
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<td></td>
<td>The convertibility law enacted in March 1991, established a currency board-type arrangement requiring full backing of the monetary base by international reserves. At the same time, the Banco Central de la Republica Argentina (BCRA) announced suspension of rediscounts and open-market operations except for RPs and RRPs.</td>
<td>Interbank Market</td>
<td>Not very active in 1995; short-term funds.</td>
<td>BCRA smooths out changes in the interbank market rate: it operates within an interest rate band by selling securities through RPs at floor interest rate, and buys securities through RRPs at the ceiling rate.</td>
<td>Liquidity Requirements (LR)</td>
<td>MOF is the principal debt management agent responsible for accounting, forecasting, planning of debt management program and day-to-day operations; BCRA is in charge of securities settlement.</td>
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<td></td>
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<td>Primary Market</td>
<td>Occasional sale of government securities; no primary dealers.</td>
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<td></td>
<td>Secondary Market</td>
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Table 2. Brazil: Market-Type and Market Instruments

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<td>1. Auction of government indexed securities in the primary market.</td>
<td>1. For debt management purposes; CBB participates in auctions, buying securities at the average price, to replenish its own portfolio for conducting open market operations (OMO).</td>
<td>1. Multiple price auctions; the CBB announces in advance type of securities and maximum amount to be sold; participants submit maximum five bids for each type of paper auctioned; the Treasury in consultation with CBB determines cut-off rate. CBB purchases in auctions are subject to a ceiling (volume of securities due at the auction date).</td>
<td>Interbank market</td>
<td>The intermediate target is base money; the short-term operating target is the interbank rate.</td>
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<td>CBB is the fiscal agent of the Treasury. The Treasury, in consultation with CBB, decides the amount of securities and cut-off rates. Decisions regarding auction volume are based on debt management considerations. Occasionally the CBB buys at market rate the entire issue of securities which is later used for OMO.</td>
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<td>2. Auction of Banco Central do Brazil (CBB) securities in the primary market.</td>
<td>2. To absorb excess liquidity.</td>
<td>2. Weekly multiple price auction of CB-bonds (BBCs); sold at discount without indexation; 28-day minimum maturity; above that limit maturities increase with 7-day increments.</td>
<td>Primary market</td>
<td>The National Monetary Council is responsible for monetary policy and the CBB for its implementation; open market operations are carried out by the CBB's trading desk. Daily intervention in the money market is based on liquidity forecasting and policy guidelines (basically the interest rate band to be met during the day).</td>
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<td>The CBB alone is in charge of settlement and redemption. Government deposits are held at the CBB; zero-maturity maturity; no restriction on Treasury withdrawals; no overdraft on current account.</td>
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<td>3. Outright sale and purchase of government indexed securities and CBB securities.</td>
<td>3. To influence liquidity conditions on a more permanent basis.</td>
<td>3. Transactions are done through formal and informal multiple price auctions; formal weekly auctions through sealed bids; informal auctions by phone directly with dealers, as needed (see below 4).</td>
<td>Secondary market</td>
<td>As of end-1994, the federal government bonded debt accounted to 12 percent of GDP, of which 40 percent is held by the CBB; outstanding debt outside CBB was mostly in the form of treasury notes (NTNs). CB-bonded debt was around five percent of GDP; BBCs were the most actively traded securities.</td>
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### Table 2. Brazil: Market-Type and Market Instruments

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</tr>
</thead>
<tbody>
<tr>
<td>4. RPs and RRPs</td>
<td>4. Main instrument for monetary control</td>
<td>4. Short-term usually overnight; government and CBB securities used as collateral. Daily intervention through informal multiple price auctions called &quot;go-arounds.&quot; In the &quot;go-arounds&quot; the CBB announces by phone to the dealers its intentions to buy or sell securities with or without intention to resale/repurchase them; dealers in turn transmit CBB's proposals to the financial market and in accordance to its response to the offer; the CBB first collects proposed rates and then proposed volumes; market halts waiting for result from the &quot;go-arounds.&quot; After CBB informs the cut-off rate the market resumes activity. These operations are carried out as many times as necessary during the day to meet the interest target or to balance the system's liquidity.</td>
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<td></td>
<td>Short-term credit facility (&quot;Special Credits&quot;)</td>
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<td></td>
<td></td>
<td>To address liquidity problems of solvent financial institutions; maximum maturity of 180 days; level of access at discretion of CBB; at penalty rate; collateral required.</td>
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<td></td>
<td>Extended credit facility (Recuperation program)</td>
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<td></td>
<td></td>
<td>To address long-term liquidity problems of financial institutions; at penalty rate; collateral required.</td>
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<td>Credit allocation</td>
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<tr>
<td></td>
<td></td>
<td>Various regulations affecting the allocation of credit, including: statutory liquidity ratio; compulsory savings schemes, and explicit budget allocations.</td>
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Table 3. China: Market-Type and Open Market Instruments

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</tr>
</thead>
<tbody>
<tr>
<td>There are no market instruments. T-bills were introduced in 1994 on an experimental basis. The People's Bank of China (PCB) is considering the introduction of market instruments for monetary policy.</td>
<td>Interbank market Regional interbank centers; no integrated national market; Primary market Organized as a syndicate composed of banks, nonbank financial institutions and securities dealers. Secondary market A market in government bonds is emerging and is fragmented; trade in stock exchanges and over-the-counter; arbitrage is difficult due technical problems in delivery and payment between the different secondary markets; improvements in the book-entry system are underway.</td>
<td>Recent decision to centralize credit to banks at PCB headquarters level; no genuine monetary programming, the &quot;credit plan&quot; is still the main instrument; monetary policy guided by three targets: a &quot;supervisory&quot; target for &quot;social credit&quot; (directed credit) of the banking sector (seen as guideline rather than rigid target), a credit target for the State Commercial Banks (SCBa) in line with the credit plan, and an indicative monetary target.</td>
<td>Monetary control is exercised mainly through bank-by-bank credit ceilings, reserve requirements and, refinancing facilities; PCB administratively determines interest rates on deposits and credits; to absorb liquidity PCB uses calling back (for monetary policy purposes) of some loans extended to financial institutions, reserve requirements, and special deposits.</td>
<td>Since 1994, discontinuation of PCB direct loans to government (all deficit financed by government bonds). MOF issues term bonds through syndicate underwriting at rates one or two percentage points above comparable deposit rates; no sales of short-term bills. Under the new system of debt management, the MOF is the only issuer of bonds, PCB is responsible for placing bonds; a chief coordinator, PCB organizes a national underwriting syndicate; the core of underwriting syndicate are 40 to 50 primary dealers.</td>
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</table>
Table 4. Czech Republic: Market-Type and Open Market Instruments

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<th>Other Instruments</th>
<th>Relation CB-MOF on Debt Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Credit auctions of refinancing credit.</td>
<td>1. Until June 1, 1994 was used for liquidity management and monetary control.</td>
<td>1. Weekly auctions of credit with 1-4 week maturities (1-2 week maturities predominant) collateral required equal to 40 percent of borrowing.</td>
<td>Interbank market</td>
<td>The intermediate target is M2; short-term operating target is bank's excess reserves; monetary stance indicator is discount rate.</td>
<td>Reserve requirements</td>
<td>CNB as fiscal agent is in charge of the preparation, organization, implementation and settlement of all matters related to the issuance of government debt and their auctions.</td>
</tr>
<tr>
<td>2. Open market-type operations with T-bills and CB-bills.</td>
<td>2. Main instrument of monetary control; used to sterilize capital inflow.</td>
<td>2. T-bills are sold in the primary market through multiple price auctions; CB-bills through uniform price auctions.</td>
<td>Primary market</td>
<td>Money market strategy is determined one week in advance in the so called &quot;Monday Meetings,&quot; chaired by the Executive Director of the Banking Transactions Department; staff from Money and Banking Transactions Departments attend the &quot;Monday Meetings&quot;; the Executive Director is accountable to the Bank Board, chaired by the Governor, which meets every second Thursday. Banking Transactions Department determines CBN daily interventions in the money market based on information prepared by the Reserves Management Division; information includes daily components of the CBN balance sheet and their forecasts.</td>
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<tr>
<td>3. Outright sale and purchase of T-bills and CB-bills.</td>
<td>3. Used for influencing banking system liquidity.</td>
<td>3. Until August 1994, the CNB functioned as the market maker.</td>
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<tr>
<td>4. RPs and RRPAs with T-bills.</td>
<td>4. Main instruments for liquidity management and fine-tuning fluctuations of bank reserves and interbank rate.</td>
<td>4. Auctions and individual RPs; 100 percent collateralized; volume auction of 1-7 day RPs; amount offered is not announced; awards procured if total requested exceeds CNB targeted repurchase volume; cut-off rate determined by CNB; individual RPs and RRPAs at rates determined by CNB; 3-4 day maturity, overnight predominant; CBN transacts with CB-bills, T-bills and National Property Fund-bills.</td>
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<tr>
<td>5. Transfer of government deposits from commercial banks to Czech National Bank (CNB).</td>
<td>5. To absorb liquidity.</td>
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Table 5. Egypt: Market-Type and Open Market Instruments

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</tr>
</thead>
<tbody>
<tr>
<td>1. Placement of commercial banks' deposits at the Central Bank of Egypt (CBE).</td>
<td>1. Aimed at absorbing excess liquidity without cost of servicing T-bills.</td>
<td>1. Placement of commercial bank time deposits (1, 2, 3 months) at CBE; deposits are allocated at administered rate; banks are selected by CBE.</td>
<td>Interbank market</td>
<td>Exchange rate is used as a guide; short-term operating target is T-bill rate; the latter is also used as a CBE stance indicator.</td>
<td>Reserve requirements</td>
<td>CBE is fiscal agent for government debt. Until 1994, CBE had more freedom to adapt T-bill volumes for monetary purposes; however more recently, given a large build-up in T-bills outstanding, this has changed. Now sales of T-bills are limited essentially to deficit financing rather than monetary management.</td>
</tr>
<tr>
<td>2. Market-type operations with T-bills.</td>
<td>2. Auctions of T-bills in the primary market is the principal instrument for monetary control.</td>
<td>2. Weekly auctions of 3 month T-bills; auctions of 6 and 12 month bills as required; multiple price; auction participation is not restricted; cut-off rate determined by CBE; amount of sales of T-bills can vary by up to 10 percent from the announced volume.</td>
<td>Primary market</td>
<td>Volume for forthcoming auctions are determined as follows: the Bank Control Department and Indirect Monetary Control unit of the CBE produce monthly projections of liquidity needs and given the budgetary financial needs of the MOF; BCD submits proposals on the amount of T-bills to be auctioned at the next three weeks to the Working Group of the CBE; the Group is chaired by the Deputy Governor who makes the final decision in consultation with the Governor; decisions on debt maturities are made public in advance to the auction; auctions operated by the Bidding Committee comprised by members of the CBE and MOF and, chaired by the Deputy Governor of CBE; This committee monitors rules, announces auction results and, determines cut-off rate.</td>
<td>Discount window</td>
<td>CBE is allowed to purchase securities in the primary market; no quantitative ceilings.</td>
</tr>
<tr>
<td>3. RPs in T-bills; no reverse repurchase agreements.</td>
<td>3. Transactions limited because of excess liquidity.</td>
<td>3. RPs with T-bills; interest auction procedure (participants submit bids covering both volume and rate); limited use and small transactions; roughly monthly.</td>
<td>Secondary market</td>
<td>Volume trading is weak due to segmentation between markets; not used for monetary policy.</td>
<td>Statutory liquidity ratios</td>
<td>Government deposits can be kept at CBE or at commercial banks; unconstrained maturity; no quantitative ceilings.</td>
</tr>
</tbody>
</table>
### Table 6. Ghana: Market-Type and Open Market Instruments

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<th>Other Instruments</th>
<th>CB-MOF Relation on Debt Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Open market-type operations with government and Bank of Ghana (BOG) securities.</td>
<td>1. Main tool for monetary control by adjusting amount of new bills issued relative to maturing bills; operations mainly with CB-bills.</td>
<td>1. Weekly auctions of BOG bills and bonds and, T-bills and T-notes; similar maturities for BOG and government securities (91 and 180 day bills, 1 and 2 year notes and 5 years bonds, in addition 30 day CB-bill); multiple price auctions; multiple bids accepted; interest rates at auctions influenced by discount rates and previous auction rates; total value and maturities of securities are preannounced; composition and maturity of securities are determined by demand during auctions; cut-off rate determined by volume of sales; a bid may be rejected by BOG if it is &quot;out of line&quot; with other bids and if it is not of a &quot;significant&quot; volume; Auction Committee arranges bids and recommends cut-off rate which is finally decided by the Governor of BOG; same securities offered on tap during the following week; auction results published weekly include range of bid rates, rates of bids allotted in full, and weighted-average rate for the week.</td>
<td>Interbank market: Active between banks and discount houses; not active among banks.</td>
<td>Intermediate target is M2; short-term operating target is bank's reserves at the BOG. The Open Market Committee is responsible for market operations; it meets once a week; it is chaired by the Governor of BOG and includes representatives of MOF. Weekly review of targets; volume of securities auctioned is determined by the projections of base money in excess of the target (undesired liquidity is sterilized) and the volume of maturing securities. The Open Market Committee guidelines prepared each Thursday determines actions of Auction Committee on Fridays.</td>
<td>Reserve requirements: Uniform cash reserve requirement on demand and time deposits (5 percent); averaging provisions; calculated contemporaneously; in addition, secondary liquidity requirement for monetary purpose (52 percent); eligible liquid assets are T-bills, CB-bills, commodity bills, and call deposits at discount houses; penalty for reserve deficiency.</td>
<td>BOG and MOF are together responsible for debt management program; interest on BOG-bills is paid directly out of the Government budget.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Primary market: Open-market type operations with government and BOG securities; nonbanks can hold either instrument; banks and discount houses can hold only BOG securities (commercial banks are banned from financing the government since 1990; discount houses were created for market making.</td>
<td></td>
<td>Rediscoun5 window: Discounting of T-bills, BOG-bills, cocoa bills and commodity bills; automatic access of discount houses with weekly limits; the discount houses in turn discount securities held by banks; banks access to discount window at penal rate; BOG is not obliged to discount securities held by banks; banks short of liquidity use the call money facility at discount houses; discount rate signals the direction of interest rate bids the bank will likely accept at auctions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Secondary market: Very thin; five brokerage firms, mainly subsidiaries of financial institutions; automatic access to securities on tap has hampered the development of the market.</td>
<td></td>
<td>Unsecured overnight loan facility: Available to discount houses.</td>
<td></td>
</tr>
</tbody>
</table>
Table 7. India: Market-Type and Open Market Instruments

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Discretionary management of government debt auction program for T-bills and dated securities (coupon securities with maturities from 1 to 10 years).</td>
<td>1. Mainly used for debt management. The rates emerging from the auctions of 91 and 364 days T-bills have become important money market reference rates. Occasional purchase of a portion of issues by the Reserve Bank of India (RBI) for open market operations at a later date.</td>
<td>1. T-bills are sold through auctions and on tap (purchases on tap are typically small). Weekly multiple price auctions of 91-day T-bills; fortnightly auctions of 364-day T-bills; RBI buys 91-day T-bills in the auctions; volume of 364-day T-bill is not preannounced giving RBI the option of adjusting supply to arrive at &quot;managed&quot; rates; T-bills are eligible for rediscounting. RBI purchases a small amount of ad hoc bills to finance the government; these issues of ad hoc bills are sold on tap and are subject to ceilings. Multiple price auctions of dated securities since April 1992; 7 to 8 auctions per year; RBI determines cut-off rate and participates in auctions noncompetitively; securities purchased by RBI are later sold in the market as appropriate.</td>
<td>Interbank market</td>
<td>M3 is the intermediate target. RBI current efforts are aimed at liquidity monitoring; to be extended to liquidity forecasting. RBI sets targets on credit to government and commercial banks; historically, market operations have been carried out mainly to meet Government finance needs by influencing prices and yields of securities, rather than for influencing liquidity conditions through changes in banks' reserves; More recently, in the context of interest rate liberalization, the RBI market operations have had the latter purpose.</td>
<td>Reserve requirement</td>
<td>RBI is the fiscal agent and advisor of the MOF. RBI accommodates automatically government cash deficits by underwriting ad hoc treasury bills was practice is planned to be phased out by 1996/97. RBI advise MOF on the quantity, timing and terms of issue of dated securities; maturities and coupon rates are determined by RBI. Central government can keep deposits to areas outside the RBI only in areas where the RBI does not have branches; no quantitative limit on government deposits withdrawals; no overdrafts on government current account.</td>
</tr>
<tr>
<td>2. Outright sales/purchases of dated securities.</td>
<td>2. Outright sales/purchases of dated securities is an important monetary instrument for discretionary monetary management and sterilization purposes.</td>
<td>2. Outright transactions with central government dated securities; the RBI pre-determines the price it offers to buy and sell dated securities.</td>
<td>Primary market</td>
<td>Major traders in securities are primarily banks, development financial institutions, insurance companies and provident funds. Secondary market</td>
<td>Reserve requirement</td>
<td>RBI provides refinancing only through collateralized loans at market rates; quantitative limits apply; frequent recourse discourages by sliding scale for loan rates. Interest rate controls</td>
</tr>
</tbody>
</table>

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Table 7. India: Market-Type and Open Market Instruments

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</thead>
<tbody>
<tr>
<td>3. RPs of dated securities with selected financial institutions; RRP of dated securities with commercial banks.</td>
<td>3. Two-way RPs used to even out liquidity within the reserve make-up fortnightly and to reduce the volatility in the call money market; also to modulate money expansion.</td>
<td>3. Dated securities as the underlying instrument; transfer of ownership of securities; RPs exclusively with Discount and Finance House of India (DFHI) and Securities Trading Corporation of India (STCI) at a rate determined by the RBI; RRP of price auction with commercial banks and stock brokers; maturity varies from overnight to 14 days (length of reserves make-up period).</td>
<td>The DFHI and STCE were set up in 1988 as joint stock companies with other institutions to facilitate smoothing of short-term liquidity imbalances and to impart liquidity to the money market; STCE provides liquidity for long-term government paper (dated securities) and to stimulate market making activity by other parties. RBI is making progress to establish a book entry system with delivery versus payment.</td>
<td>Switching facility</td>
<td>Until 1992, the RBI purchased low coupon notes against sale of high coupon notes which improved portfolios of banks and financial institutions.</td>
<td></td>
</tr>
<tr>
<td>Instruments</td>
<td>Purpose and Use of Instruments</td>
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</tr>
<tr>
<td>1. Auction of Bank Indonesia (BI) certificates (SBIs).</td>
<td>1. Principal tool for absorbing liquidity; to give banks an alternative for investing their excess reserves in foreign assets.</td>
<td>1. Weekly multiple price auction of 7 to 357 days SBIs held every Wednesday; settlement on Thursday; BI sets amount and maturity required; no information on the amount is provided to the bidders. Further auctions can occur on any other day, but same day settlement; at this daily auctions BI sets the cut-off rate for each maturity auctioned; SBIs cannot be bought before maturity. Total amount auctioned of SBIs per month in 1993 was US$2.5 billion.</td>
<td>Interbank market</td>
<td>No formal intermediate target, BI monitors M2 and credit to financial institutions; BI also monitors daily short-term reserve money. Each Thursday, an Open Market Committee meeting is held to discuss changes in factors affecting bank reserves and recommends a plan for the following weeks; the results of the meetings are proposed to the Steering Committee which is chaired by the Governor.</td>
<td>Reserve requirement</td>
<td>Prohibition on domestic borrowing under “balance budget rule;” no government securities outstanding.</td>
</tr>
<tr>
<td>2. Purchase of bank-endorsed commercial paper Surat Berharga Pasar Uang (SBPU).</td>
<td>2. To inject liquidity.</td>
<td>2. Four types of obligations eligible for purchase by BI: promissory note issued by a bank or nonbank financial institution; promissory note issued by the customer of a bank, but endorsed by the bank; banker’s acceptance, or a time draft issued by a third party and accepted by a bank and bill of exchange similar to a trade acceptance. BI purchases SBPUs with maturities ranging from one week to twelve months in daily auctions similar to those held for SBIs; dealers present offers to sell specific amounts at specific yields, BI selects a cut-off rate that covers the amount it wants to buy. SBPUs are also traded between banks.</td>
<td>Secondary market</td>
<td>The following day auction open at 8:00 am, bids are taken over by phone until 11:00 am, bids are confirmed by fax and at 12:30 pm. Successful bidders are notified by wire. Instructions to debit dealers’ accounts at BI enter the daily clearing and are cleared by 2:00 pm. BI staff then prepare the certificates (bearer form), record all sales for the file, and make a short proposal for the following day auction.</td>
<td></td>
<td>Government deposits are held at BI; exceptions are some overnight deposits related to tax collection and some deposits held in certain government banks to finance expenditure in areas where BI does not have branches; no maturity constraint or quantitative ceiling.</td>
</tr>
</tbody>
</table>

**Table 8. Indonesia: Market-Type and Open Market Instruments**

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### Table 8. Indonesia: Market-Type and Open Market Instruments

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</thead>
<tbody>
<tr>
<td>3. RPs with SBIs and SBPUs.</td>
<td>3. For liquidity management; minor instrument</td>
<td>3. Weekly auctions of one-week RPs with SBIs and SBPUs as underlying security; interest and volume auction procedures; involve transfer of securities' ownership.</td>
<td>Bank must keep a loan/deposit ratio of less than 110 percent</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. Transfer of government enterprises deposits.</td>
<td>4. To absorb liquidity; occasional use.</td>
<td>4. Compulsory transfer of deposits from deposit money banks to BI to be converted in a SBI issue.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### Table 9. Malaysia: Market-Type and Open Market Instruments

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<tr>
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<th>CB-MOF Relation on Debt Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Direct lending and borrowing by NBM</td>
<td>Principal tool for monetary control; mainly borrowing to neutralize large scale capital inflows.</td>
<td>1. BNM deals with banks on a bilateral basis since 1992; mainly short-term borrowing; initial maturity periods of one to three months, now extended to six months; conditions (maturity, rate structure and amount) vary according to the needs of BNM.</td>
<td>Interbank market</td>
<td>Intermediate target is M3; short-term operating target is the KLIBOR rate.</td>
<td>Reserve requirements</td>
<td>NBM acts as a fiscal agent and financial adviser to the treasury.</td>
</tr>
<tr>
<td>2. Auction of CB-bills.</td>
<td></td>
<td>2. Maturities of 3, 6 and 12 months; CB-bills are radiaccountable.</td>
<td>Secondary market</td>
<td>A money Market Trading Desk in the Banking Department was set up in January 1988 to monitor trading activities of the market and create activity with the objective of developing depth in the market. The Banking Department responsibilities include: formulating, implementing, supervising banking policies related to the development of the money market operating, and managing the BNM's rediscounting and lender of last resort window.</td>
<td>At market rate; not formally announced to the public; collateral required; maturity of up to two weeks; recourse to facility infrequent, discouraged by moral suasion.</td>
<td>Short-term credit facility</td>
</tr>
<tr>
<td>3. Transfer of government and Provident Funds</td>
<td>Auctions on ad hoc basis to absorb excess liquidity.</td>
<td>3. Deposits placed at BNM are remunerated at market rates. The auction system determines allocation of government deposits among banks; Government deposits account for more than 10 percent of banking system deposits.</td>
<td></td>
<td></td>
<td>Rediscount facility</td>
<td>NRM acts as a fiscal agent and financial adviser to the treasury.</td>
</tr>
<tr>
<td>4. Outright sale and purchase of government</td>
<td>Primarily purchases; minor use.</td>
<td>4. Outright transactions are limited by the availability of government securities in the market; BNM's portfolio of government securities (0.5 percent of total outstanding securities (June, 1993) and, statutory investment requirement.</td>
<td></td>
<td></td>
<td></td>
<td>NRM acts as a fiscal agent and financial adviser to the treasury.</td>
</tr>
<tr>
<td>securities</td>
<td></td>
<td></td>
<td>A major constraint for open market operations is the lack of government securities; BNM trades on T-bills, government bonds (Cagama bonds) and, CB-bills.</td>
<td>Twenty-three principal dealers participating in the primary market (including 7 discount houses) provide two-way quotations in the secondary market; all transactions in an on-line book entry system called Scriptless Security Trading System (SSTS).</td>
<td></td>
<td>NRM acts as a fiscal agent and financial adviser to the treasury.</td>
</tr>
</tbody>
</table>
Table 9. Malaysia: Market-Type and Open Market Instruments

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</tr>
</thead>
<tbody>
<tr>
<td>5. RPs and RRP.s</td>
<td>5. To offset short-term volatile fluctuations in the interbank interest rate; Frequently used.</td>
<td>5. RPs involve transfer of securities ownership; underlying securities are commercial paper and government securities; RPs cannot be transacted on a call or rollover basis.</td>
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</tbody>
</table>

Statutory liquidity ratio
No changes since 1985; 17 percent of eligible liabilities (money at call, inter-bank balances, T-bills, other liquid assets); further rise in ratio was constrained by insufficient securities, particularly government securities.

Direct instruments
Interest rate control on priority sector lending; selective control of credit extension (Guidelines on Lending); two guidelines: one on credit card operations and another on loans for purchase of private motor vehicles; guidelines are introduced only under compelling circumstances and for limited periods.

Selective controls on capital inflows (limit on swap transactions with foreign customer non-trade related swaps).
Table 10. Mexico: Market-Type and Open Market Instruments

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</thead>
<tbody>
<tr>
<td>1. Auction of government securities in the primary market (including T-bills (Cetes) and exchange rate-indexed bonds).</td>
<td>1. Primary market is used for government funding; BOM is allowed to purchase securities at market price for monetary regulation (for resale on the market or to absorb liquidity) only if the counterpart is frozen in deposits at the BOM (interest is paid on the account).</td>
<td>1. Each Friday, BOM announces securities, amounts, and types of maturities for the following Tuesday auction; settlement takes place on Thursday; multiple and uniform price auctions; number of bids accepted per participants varies on specific auction.</td>
<td>Interbank market</td>
<td>Intermediate target is BOM's net domestic assets growth (excluding Tesobono amortization); short-term operating target is interbank rate (1995).</td>
<td>Reserve requirements</td>
<td>The principal debt management agent is BOM. The MOF and BOM are responsible for accounting, forecasting and planning the debt management program. The CB is in charge of day-to-day operations.</td>
</tr>
<tr>
<td>2. Credit auctions.</td>
<td>2. Credit auction characteristics (amount, maturity and other) are preannounced; twice per week auction; collateral is required since 1995 (government and banks securities); also uncollateralized credit at penalty rate; participation restricted to commercial banks; multiple and uniform price auctions.</td>
<td>3. To eliminate mismatches in the interbank market.</td>
<td>Secondary market</td>
<td>To attain these targets the Board of Governors considers and acts in accordance to the following: (i) discrepancies between actual and expected inflation; (ii) behavior of the exchange rate and interest rates differentials (terms and between instruments (Tesobono and Cetes)).</td>
<td>Other Instruments</td>
<td>BOM sets a ceiling on total credit to Government during a given year; the ceiling does not include the BOM's purchases of Government paper directly from the Government for monetary purposes.</td>
</tr>
<tr>
<td>3. Outright purchase and sale of government securities.</td>
<td>3. Outright purchases and sales of Cetes (with maturities from 7 to 182 days) and Bonobras (government bonds with maturities of 1-2 years) in secondary market.</td>
<td>4. In the interbank market.</td>
<td></td>
<td>Dominated by domestic investors; the bulk of open market transactions are RPs and RRPAs with dealers rather than outright transactions.</td>
<td>CB-MOF Relation on Debt Management</td>
<td>Government deposits can be kept outside BOM; maturity is unconstrained; no quantitative ceilings apply. Overdraft facility on government current account at BOM; access 1 percent of budgeted revenue for the current year; cost is T-bill rate of the latest auction; no specified maturity.</td>
</tr>
<tr>
<td>4. RPs and RRPAs.</td>
<td>4. BOM conducts RPs and RRPAs with Cetes, Tesobonos, Tesobonos and Bonobras; maturities of up to 28 days, overnight most frequent; RP transactions are done through volume and interest auctions.</td>
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Table 11. Philippines: Market-Type and Open Market Instruments

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<th>CB-MOF Relation to Debt Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Open market-type operations with T-bills</td>
<td>1. Until 1993, auctions of T-bills in the primary market in amounts above the financial needs of government budget were the main instrument for liquidity management.</td>
<td>1. When operating mainly in the primary market, the BSP influenced liquidity by changing the size of weekly auctions of T-bills; maturities include 91, 182, and 364 days; cut off price in the auction linked to the price range accepted in the previous week (usually between 20-30 basis points).</td>
<td>Interbank market</td>
<td>The intermediate target is base money (defined as reserve money plus holdings of reserve eligible government securities and reserve deficiencies of deposit money banks); the short-term operating target is the interbank rate.</td>
<td>Reserve requirements</td>
<td>Since 1993, T-bill auctions by the Department of Finance (national government) are aimed solely at financing the budget; responsibility for monetary policy was assigned to the newly restructured BSP, which was allocated a large portfolio of T-bills for this purpose.</td>
</tr>
<tr>
<td>2. Outright sale and purchase of T-bills</td>
<td>2. Main instrument for monetary control since 1993.</td>
<td>2. Outright transactions are carried out on a day-to-day basis.</td>
<td>Primary market</td>
<td>Even though there is no target exchange rate (true float arrangement), the BSP intervenes in the foreign exchange market with a view to smooth exchange rate fluctuations.</td>
<td>Change in RR are reported to affect liquidity conditions permanently; RR have been reduced gradually from 25 percent in 1993 to 17 percent in April 1995; remunerated.</td>
<td></td>
</tr>
<tr>
<td>3. RPs &amp; RRPs</td>
<td>3. Mainly RRPs to absorb excess liquidity.</td>
<td>3. RP transactions involve the transfer of ownership of the underlying instrument (mainly T-bills); interest rates determined by BSP in relation with market rates (T-bill and interbank rates); two types of RPs: overnight with banks (at penalty rate) and, term with dealers to remove their excess inventories of securities for periods from 7 to 30 days; maximum maturity 364 days for RRPs.</td>
<td>Secondary market</td>
<td>The highest monetary policy-making body is the Monetary Board which consists of the Governor of the CB as chairman, the Secretaries of Finance, Budget, Trade and Industry, and Economic Planning, and two representatives from the private sector as members; weekly meetings.</td>
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</tr>
<tr>
<td>4. Sales of CB-bills securities</td>
<td>4. To supplement T-bill operations (particularly in absorbing capital inflows).</td>
<td></td>
<td></td>
<td>Open Market Committee is responsible for implementing and conducting monetary policy.</td>
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</tbody>
</table>

Since 1993, T-bill auctions by the Department of Finance (national government) are aimed solely at financing the budget; responsibility for monetary policy was assigned to the newly restructured BSP, which was allocated a large portfolio of T-bills for this purpose.

Prior to the 1993 restructuring, the price of T-bills was freely determined and quantity decided by a coordinating committee of the central bank and Department of Finance in accordance with budget financing and monetary policy requirements; if monetary policy required a volume of securities above that necessary for budget financing, the excess was deposited with the central bank and, by agreement, was not available to the Government.

Government deposits can be kept at BSP or at Government-owned banks.
Table 12. Poland: Market-Type and Open Market Instruments

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</tr>
</thead>
<tbody>
<tr>
<td>1. Auction of T-bills in the primary market.</td>
<td>1. Not used as monetary instrument; T-bills strictly for Treasury funding.</td>
<td>2. Active, interbank rate is benchmark for the cost of short term funds.</td>
<td>Interbank market</td>
<td>Intermediate target is NDA; short-term operational target is free reserves of the commercial banks. Open market operations are conducted in the following manner: the size and direction of the intervention to be conducted in the market is based on the desired monetary stance and weekly liquidity projection of the Monetary and Credit Policy Department. In the morning (at around 10:00 am), the NBP announces the size and type of the operations and invites auctions for a deadline of noon; bids accepted are communicated within an hour after the auction deadline.</td>
<td>Reserve requirements</td>
<td>The NBP acts as advisor, issuing agency, and fiscal agent of the MOF.</td>
</tr>
<tr>
<td>2. RPs and RRPs with T-bills.</td>
<td>2. Main monetary policy instruments.</td>
<td>2. RPs and RRPs through multiple-price auction and volume tender methods; frequency at discretion of NBP; same day settlement; 1-14 day maturity; fully collateralized by T-bills at face value; primary dealers only; volume tenders are used to give strong signals to the market.</td>
<td>Primary market</td>
<td>Change infrequently; all banks; 20 percent on domestic demand deposits; 10 percent on domestic term deposits; 1 percent in foreign currency deposit; averaging provision; three-day accounting period; 31-day holding period.</td>
<td>Short-term credit facility (Lombard)</td>
<td>Access subject to quantitative limit (2.4 percent of capital); maturity of three months; generally above market rate; T-bills are used as collateral.</td>
</tr>
<tr>
<td>3. Outright sale and purchase of T-bills.</td>
<td>3. Introduced in 1995 to enhance the National Bank of Poland's (NBP) capabilities for influencing liquidity on a more permanent basis and to counteract seasonal phenomena.</td>
<td>3. Group of 21 primary dealers trade in secondary market; active in RPs; trading in T-bills has been limited due to the lack of book-entry system; this system was introduced in July 1995.</td>
<td>Secondary market</td>
<td>Extended credit facility</td>
<td>Rediscount window</td>
<td>Refinance rate above Lombard rate is a key monetary instrument signaling NBP policy intentions; medium-term refinance of former central plan credits and for nine banks separated from monobank system; Ministry of Finance guarantee is used as collateral.</td>
</tr>
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Table 13. The Russian Federation: Market-Type and Market Instruments

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Purpose and Use of Instruments</th>
<th>Operating Procedures</th>
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<th>Decision Making Process</th>
<th>Other Instruments</th>
<th>CB-MOF Relation on Debt Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Auction of T-bills in primary market.</td>
<td>1. Limited use as a monetary instrument.</td>
<td>2. In some auctions, CBR purchases T-bills directly from banks when the total demand for T-bills is not enough to repay those that are maturing as of that date; it also purchases T-bills from the screen-based secondary market at Moscow Interbank Currency Exchange (MICEX).</td>
<td>Interbank market</td>
<td>Intermediate target is not domestic assets of the CBR; short-term operating target is exchange rate.</td>
<td>Monetary control is exercised primarily through RR on domestic currency deposits and foreign exchange sales.</td>
<td>Law establishes an upper limit on domestic debt; CBR can purchase government securities from the MOF; CBR is closely involved as advisor, issuing agent, and fiscal agent to the MOF.</td>
</tr>
<tr>
<td>2. Outright purchase of T-bills.</td>
<td>2. To develop secondary market by promoting liquidity and maintaining an upward sloping yield curve. To this aim the Central Bank of the Russian Federation (CBR) submits bids or offers if there is temporarily a significant imbalance between the volume of bids and offers from the dealers.</td>
<td>3. Since February 1994, monthly auction of 3-month credits (longer maturity than the interbank market); multiple-price auction method is used with a floor price equal to CBR reference rate. CBR pre-announces the cut-off rate to provide guidance to participants; 100 percent collateral is required; acceptable collateral includes hard currency deposits and balances in correspondent accounts; access is restricted to banks meeting the 8 percent risk-weighted capital to asset ratio; maximum lending per borrower is 25 percent of capital; auctions are initially decentralized, now in process of being centralized.</td>
<td>Primary market</td>
<td>A five-day reporting system, recently in place, allows CBR monitoring banks' liquidity to determine the type of intervention consistent with monetary policy targets.</td>
<td>Reserve requirements</td>
<td>CBR is in charge of auctions of T-bills; other type of government debt is sold directly by the MOF (short- and long-term bonds and, gold certificates).</td>
</tr>
<tr>
<td>3. Credit auctions.</td>
<td>3. Liquidity management to reduce market segmentation and monetary control; volume of credit auction is extremely small.</td>
<td>4. CBRS sells foreign exchange in each of the regional auctions and in the interbank market in Moscow; in the auction, the CBR sets the maximum amount to be sold; a uniform price auction is used; in the screen-based interbank market, the CBR continuously monitors and intervenes when it is considered appropriate.</td>
<td>Secondary market</td>
<td></td>
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<tr>
<td>4. Sales of foreign exchange.</td>
<td>4. To limit fluctuations in the exchange rate.</td>
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<tr>
<td>Instruments</td>
<td>Purpose &amp; Use of Instruments</td>
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<td>Structure of Markets</td>
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<td>Other Instruments</td>
<td>CB-MOF relation on Debt Management</td>
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<tr>
<td>1. RPs and RRP.</td>
<td>1. Main monetary policy instruments.</td>
<td>1. RP transactions with Government and Government-guaranteed state enterprises bonds as the underlying securities; involve transfer of securities ownership; maturity range from overnight to 6 months; most popular are overnight and 7 days (attributed to the lack of market-makers for longer maturities). RP transactions are done twice daily in a method similar to a Dutch auction; after receiving all bids and offers from potential buyers and sellers of bonds on a RP or RRP basis, BOT determines a market-based allocation by giving, in the case of an RP, priority to borrowers, offering highest interest rates (if there is excess demand for funds); in the case of an RRP, by giving priority to lenders asking the lowest interest rate (if there is excess supply of funds).</td>
<td>Interbank market Largest component of the money market; for loans and deposits; maturities from overnight to 6 months, but mostly one week or less, wide interest rate fluctuations.</td>
<td>No explicit intermediate target; BOT sets specific targets in its credit plan and exercises moral suasion to ensure compliance by domestic banks; finance companies and foreign banks are in the process of being brought into this plan.</td>
<td>Reserve requirement Uniform ratio of 7 percent; applied to depository institutions' eligible liabilities; eligible assets are: deposits at BOT (no less than 2 percent of deposits liabilities); cash in vault (no more than 2.5 percent), and the rest in Government securities including guaranteed state enterprise bonds; required and excess reserves are used to settle payments; biweekly average of the reserve maintenance and calculation periods; lagged structure.</td>
<td>BOT is fiscal agent for the Government; fiscal policy has carried out much of the burden of liquidity control by running budget surplus.</td>
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<td>Secondary market Second largest component of the money market; RP market is thin and small; main market for BOT intervention for adjusting banks reserves; eligible counterparts for RP transactions are: commercial banks, finance and securities companies, credit finance companies, approved state enterprises.</td>
<td></td>
<td>Movement in banks' excess reserves on a daily basis are not monitored; a short-term forecasting of factors affecting base money has not yet been fully developed.</td>
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<td></td>
<td>An implicit target zone for the RPs rate movements (e.g., at 6-8 percent for seven days RPs).</td>
<td>Short-term credit facility &quot;loan window&quot; The window is the lender-of-last resort facility; available to commercial banks and finance companies; maturity from overnight to 7 days; fully collateralized loans (Government and Government guaranteed bonds); collateral is accepted at 90 percent of face value, for which the BOT charges the Bank rate (Standard Loan Rate) which was above RP market rate for comparable maturity as of November 1994; the window closes at 4:00 p.m., half an hour after the close of RPs market.</td>
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</tbody>
</table>
Table 14. Thailand: Market-Type and Open Market Instruments

<table>
<thead>
<tr>
<th>Instruments</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2. Auction of Bank of Thailand’s (BOT) own bills</td>
<td>2. Since August 1995; to absorb excess liquidity; 2. Maturing of one, three and six months.</td>
<td>BOT intervenes as needed to inject or absorb reserves; same day payment of RP's transaction of bonds by means of transferring money in the participants' account held at the BOT.</td>
<td>Secondary market in Government securities (outright transactions) is virtually non-existent; there are no brokers or dealers; no auctions of T-bills since 1989; the limited quantity of securities on issue has tended to be tightly held by banks to satisfy RR, resulting in a shortage of market-oriented instruments for monetary policy. The BOT can trade in its CB-bills in the secondary market</td>
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</table>

Statutory liquidity ratio
Institutions not accepting deposits are subject to a 7 percent liquidity ratio.

Foreign exchange window
The BOT administers the Exchange Equalization Fund (EEF) which stands ready to buy and sell U.S. dollars for Baht at preannounced exchange rate on a daily basis.

Lending restrictions
Restrictions include bank-by-bank credit ceilings and sectoral credit allocation (banks are required to increase their previous years share of lending to priority sectors and decrease it to nonpriority sectors).
### Table 15. Tunisia: Market-Type and Open Market Instruments

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Auction of T-bills in the primary market.</td>
<td>Not used as a monetary instrument; introduced in 1989 to encourage the open market operations.</td>
<td>2. Weekly volume credit auction at initiative of BCT, fixed amount of credit; maturity of 7-days; selected bank loans are used as collateral; the list of securities eligible for refinance credit may change from auction to auction. Lack of transparency in the method of determining the average auction rate and the use of an arbitrary adjustment mechanism to correct the volume of refinance credit assigned to individuals have limited the success of this instrument; since 1991, the CBT has accepted only the minimum rate proposed by banks.</td>
<td>Interbank market</td>
<td>Intermediate target is M2; short-term operating target is bank’s reserves. Operations of BCT are based on a 10-day financial program whose purpose is to determine liquidity position of banks and their demand for refinancing; refinancing is estimated as a function of currency in circulation, current account of the treasury and net foreign assets. Results of the exercise are used as input into the final decision of the Money Market Committee on the level of liquidity to be provided, and its allocation between the credit auctions and RP facility; the Committee’s decision is based not only on the desired stance of monetary policy but also on various other objectives, such as adequate remuneration of savings, impact on small- and medium-sized enterprises, etc.</td>
<td>By June 1994 the liberalization of lending rates for nonpriority sectors was completed; however, lending requirements for priority sectors and preferential lending rates for the same sectors still apply. Reserve requirements: Ratio of 2 percent on eligible liabilities; partially lagged; based on daily average of balances at the BCT during a period from the 16th of a month to the 15th of the following month; noncompliance is penalized. Mandatory minimum subscription requirement: T-bills are not required to be kept in banks portfolios and can be sold to non-bank public; banks are allowed to repurchase T-bills from the public at face value. Short-term credit facility: The most important source of refinancing and instrument for monetary control, 7-day RP facility with private paper, at penalty rate set by BCT (credit auction rate plus a margin which can be modified); access to facility automatic but discouraged by moral suasion; initially was conceived as a short-term credit facility; now used to provide residual liquidity to banks whose needs exceed the auctioned liquidity.</td>
<td>The principal debt management agent is MOF; responsible for accounting, forecasting, planning and day-to-day operations.</td>
</tr>
<tr>
<td>2. Credit auctions.</td>
<td></td>
<td>2. Weekly auction of credit against collateral to provide refinancing credit; BCT is allowed to absorb voluntary deposits at the BCT (not used).</td>
<td>Primary market</td>
<td>No liquidity management through primary market. Secondary market</td>
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Case Studies

I. Brazil

The monetary authorities in Brazil began using open market-type operations as their main instrument of monetary control in the 1960s. Over the years, the operational procedures and characteristics of the securities traded underwent many modifications in response to the growth of government debt, acceleration in inflation, and transformation in the relationships among the Central Bank of Brazil (CBB), the Bank of Brazil (BB), and the Treasury. Innovations and new procedures, in turn, brought about an evolutionary transformation of monetary instruments and market operations.

Prior to the adoption of open market-type operations in the 1960s, the only instruments of monetary control available to the CBB were its selective credit facilities, reserve requirements, interest rate subsidies, and minimum portfolio requirements imposed on the financial institutions. The monetary authorities used these instruments not only to control liquidity, but most importantly, also to channel funds into priority sectors, including agriculture and export industries.

The high and unstable inflation and the need to finance the deficit prompted the CBB to begin open market type operations by issuing indexed government bonds (ORTNs) in 1964, first on tap but later through auctions. The yield on the ORTNs consisted of monetary correction in addition to a fixed interest rate. Monetary correction was determined by lagged inflation as measured by the official consumer price index. 1/

It soon became clear that an instrument with shorter maturities than ORTNs was needed for the CBB to regulate liquidity and, at the same time, develop a market in the government securities with sufficient breadth and depth. Investors considered ORTNs to be risky in times of high inflationary expectations because of the relatively long maturities of these instruments—ranging from six months to two years. 2/ At times, the ORTNs' rate of monetary correction fell short of the actual rate of inflation, rendering their yields negative in real terms.

1/ Given the chronically high rates of inflation in Brazil, much of the rapid growth of financial assets was made possible by the application of monetary correction to nominal values of financial assets.

2/ To promote the purchase of ORTNs, the CBB obliged the banks to fulfill part of their reserve requirements by keeping ORTNs with the CBB.
Thus, in August 1970, the CBB began auctioning short-term Treasury bills (LTNs) at a pre-fixed interest rates. 1/ The pre-fixed nature of the instruments meant that they were not indexed to inflation but carried high nominal interest rates to compensate inflationary expectations.

In an effort to facilitate the development of a market in government securities, the CBB instituted a custody service for the LTNs, free of charge, whereby the LTNs acquired in auctions or on the market would remain with CBB for safekeeping. This service helped reduce operational costs, speed transactions, and facilitate the way for growth of an interbank market in these securities.

The CBB held weekly auctions of LTNs and monthly auctions of ORTNs and acted as a dealer for government securities by guaranteeing their liquidity. It also appointed primary dealers who quoted buying and selling prices for these securities on request. Nonfinancial firms and individuals were able to transact through these appointed dealers. Small financial institutions were allowed to purchase LTNs non-competitively at rates already determined on the day of the auction.

To facilitate the processing of securities transactions, in 1978, the CBB, jointly with the National Association of Open Market Institutions (Andima) established a tele-processing system, the Special System for Settlement and Custody (SELIC). 2/ The CBB operated SELIC which provided computerized processing of open market operations of government securities as well as trading and custody services. 2/ Settlements and transfers occurred with simple debits and credits to the accounts of the financial institutions and their clients. Financial institutions registered in SELIC were allowed to participate directly in auctions of securities, while individuals and other institutions could participate through authorized dealers. This system helped increase flexibility in the mechanisms of registration, clearing, and settlement of securities transactions.

By the mid-1970s, the open market operations of the CBB grew to such an extent that they became the dominant instrument of monetary policy. A deep and broad market in government securities developed both as a result of the above mentioned efforts and also because of the favorable high real rates of

1/ Initially, LTNs had maturities of 42 and 91 days. Later LTNs with maturities of 42 days were replaced with those with maturities of 182 and 365 days.

2/ Today, Andima—an association of financial institutions companies, and individuals trading and investing in the open market—provides valuable daily information concerning all aspects of investment in the secondary market.

3/ Later, a similar system, Center for Custody of Private Securities (CETIP) was established to provide an identical mechanism for the clearing, settlement, and custody of transactions in securities issued by financial institutions.
return on securities, facilitated by indexation. The CBB was active in both the primary and secondary markets, holding regular auctions of ORTNs and LTNs, undertaking outright sales and purchase of LTNs from its own portfolio, and conducting RPs and RRPs in the overnight market.

The CBB’s open market operations in the overnight market aimed at managing liquidity in highly inflationary times by influencing the level of interest rates in the economy. It set and announced the overnight interest rates and supported them by acting as a residual buyer. 1/ It also periodically purchased or sold from its own portfolio through a process called "go-around" whereby the CBB contacted by phone over 20 dealers in government securities with specific bids. 2/

At times, however, the securities market experienced sharp drops in dealers demand for new issues of Treasury securities, which threatened the smooth functioning of the daily open market operations of the CBB. These problems arose because of the maturity imbalances in the dealers portfolios during periods of liquidity tightening. Basically, these portfolios contained a high percentage of securities of up to five years maturity that were financed mainly on an overnight basis. At times when the overnight rates increased above the rate of inflation, dealers became vulnerable to large negative "carry over" and heavy losses. Often, these losses were so extensive that the demand for new issues of securities dissipated completely.

An important element of the financial structure in Brazil was the existing relationship between the CBB, the BB (a commercial bank), and the Treasury. Basically, monetary authorities consisted of both the CBB and the BB with combined responsibilities that extended far beyond conventional central banking. That is, the CBB, in addition to regulating monetary and credit aggregates had fiscal and development functions. It raised resources through the placement of Treasury debt which, together with direct transfers from the Treasury, were utilized to finance specific expenditures. 3/

Meanwhile, BB—the largest commercial bank in Brazil—was the agent of the Treasury and received resources from the CBB for the execution of budgetary expenditures and for on-lending to agriculture and public enterprises. The BB had access to central bank’s rediscount facility (conta de Movimento), an unrestricted and interest-free line of credit, on which it could draw

1/ Given the high degree of liquidity of LTNs, and because they were perceived to be low-risk assets, the discount rate on LTNs set the floor for the overall structure of interest rates with the exception of savings deposits rates, which were fixed by the monetary authorities.

2/ A market for overnight certificates of deposits also developed that functioned mainly through informal channels.

3/ These expenditures included, inter alia, direct subsidies on certain agricultural goods and agricultural minimum price operations.
without prior approval of the CBB. Under this arrangement, the CBB issued ORTNs and LTNs to mobilize resources for on-lending or para-fiscal spending and, at the same time, to affect short-term interest rates.

By the mid-1980s, the acceleration of inflation to 20 percent per month caused a significant shift of funds from M1 into assets indexed to inflation, especially government securities. Being indexed, these securities were better stores of value than money. They offered positive real returns combined with daily liquidity deriving from the commitment of the CBB to be a residual purchaser in the market. Thus, over time, federal securities that were held by the private sector increasingly became close substitutes for money. In fact, the public could make payments with a draft drawn on a remunerated deposit account holding federal titles.

By the end-1980s, the acceleration in inflation led the authorities to undertake a series of stabilization programs that included reforms of monetary institutions and arrangements to gain better control over liquidity in the banking system. Under the first such program, the Cruzado plan, initiated in 1986, the authorities replaced ORTNs with OTNs. The latter had similar characteristics as ORTNs but had a constant nominal value. The CBB auctioned OTNs on behalf of the Treasury and kept a certain amount of the securities for its own monetary operations. As inflationary expectations remained high, however, the fixed nominal value of OTNs limited the authorities success in marketing these instruments.

Notwithstanding the introduction of the OTNs, the two most important changes that occurred during the Cruzado plan were the introduction of the CBB's own debt instruments for conduct of monetary policy and a better separation of the functions of the monetary, commercial, and fiscal institutions. 1/

As a response to the drop in demand for the OTNs, the CBB began issuing and auctioning its own debt securities, central bank bills (LBCs) and central bank bonds (BBCs) in May 1986. 2/ The central bank bills were meant to reduce the government’s debt service cost since the real interest rates paid on these instruments were lower than those paid on Treasury securities. At the same time, the switch to central bank bills also helped diminish the vulnerability of dealers to capital losses since the yield on these bills, apart from their initial discount, was equal to the average cost of borrowing in the overnight market. The CBB repurchased a

---

1/ As part of the Cruzado plan, a number of special lines of credit were established for banks experiencing temporary shortages of liquidity (see Appendix I).

2/ The LBCs had a maximum maturity of 30 months and were sold at a discount of about 0.6 percent per annum. BBCs had a minimum maturity of 28 days. Above that limit maturities increased every seven days. These securities were not indexed.
significant part of outstanding Treasury securities and henceforth used the LBCs as the main instrument in open market operations. The yield on the LBCs became the primary indicator for inflation indexation.

The nominal interest rate in the overnight market continued to be set daily by the CBB. The CBB conducted its open market operations so that the average overnight rate from the 15th day of one month to the 14th day of the following month would be equal to the inflation rate for the first month (on a calendar basis). As a result, the real interest rate on the LBC was kept close to the initial discount.

The new reform plan also separated the responsibilities of the CBB from the commercial activities of the BB by transferring the reserve deposits of financial institutions and the Treasury deposits from the BB to the CBB. The authorities also completed the separation of the fiscal and monetary budgets, and began including the indirect expenditures carried out on behalf of the Treasury by the monetary authorities directly into the fiscal budget. Additionally, the CBB tightened access to its special credit window and closed its "conta de movimento." In addition, the responsibility for debt management and issuance of government securities was transferred from the CBB to the Treasury.

With inflation exceeding 25 percent a month in mid-1987, the authorities adopted a new anti-inflationary plan—the Bresser Plan. Under this plan, to improve the flexibility of monetary policy, the CBB ended its commitment to keep the average monthly overnight rate strictly aligned with the inflation rate. In practice, however, a close link between the two rates continued to hold—as the exchange rate adjustment still followed inflation—the LBCs rate had to be kept higher than inflation to prevent capital outflows but not so high as to raise inflationary expectations. The link between the overnight rate and the inflation rate, however, limited the ability of the CBB to pursue an independent monetary policy as the real interest rate in the overnight market became, in effect, pegged at about zero. To alleviate this problem, the CBB made the yield on OTNs once again the primary indicator for inflation indexation beginning October 1987. By doing so, it was able to increase the rate on central bank bills without automatically raising interest rates on all financial instruments, thereby improving its ability to pursue monetary goals.

Beginning 1988, as part of a plan to diversify its debt management instruments, the Treasury began issuing various new indexed and non-indexed securities with maturities ranging from the very short term to the long term, including floating interest rate Treasury Financing Bill (LFTs), OTN

1/ The responsibility for issuing federal government securities was transferred to a newly established Secretariat of the Treasury within the Ministry of Finance.
Cambial (to give exporters an exchange rate hedging facility), Treasury Notes, (NTNs), and Treasury bonds (BTNs). These securities were to be used only for deficit financing. 

Subsequent stabilization plans implemented further changes that included, inter alia, elimination of OTNs altogether, abolishment of backward-looking indexation for financial assets and its replacement by a new forward-looking index, the Reference Interest Rate (TR), and the creation of mutual funds administrated by financial institutions (FAFs) for investments of less than one month. The monetary authorities also resorted often to frequent changes in the reserve requirements for short-term objectives.

Currently, the CBB auctions its own instruments (LBCs, BBCs, and NBC-Es) to absorb liquidity and Treasury securities for debt management. In addition to weekly auctions of the LBCs and the monthly auctions of Treasury securities, the CBB also undertakes sporadic auctions, and outright purchases and sales to influence liquidity conditions in the economy. It also continues to use RPs and RRPs as its main instrument of monetary control, involving both LBCs and government securities in the secondary market. It also conducts outright sales and purchases of both LBCs and government indexed securities.

In conclusion, the development of the open market operations in Brazil paralleled in many ways the evolution of the inflationary process and the expansionary fiscal policy of the Government. Such an evolution helped create sufficient amount of government securities for the development of a deep and broad market with significant number of participants, albeit with serious costs associated with high debt service and growing and unstable

1/ LFTs had the same characteristics as the central bank bills except that their issues required specific Congressional approval. Issuance of OTNs only required authorization of the MOF. The BTNs had maturities of up to 25 years with a fixed interest rate of up to 12 percent per annum above monetary correction.

2/ TR is linked to the rate for one-month bank certificates of deposit (CDs). The TR is calculated as the average of interest rates on CDs of the main financial institutions over the previous three days, minus 1.02 percent to account for taxes and the real interest rate component.

3/ The structure of the reserve requirements remained cumbersome, with differentiated characteristics depending on the specific financial institution. Such a differentiated structure of reserve requirements helped contribute to large interest rate distortions and widespread discrepancies between lending and borrowing rates.

4/ NBC-Es are CBB's special notes which are indexed to the exchange rate.
inflation. The complementary mix of instruments and, primary and secondary market operations allowed the authorities to cope with surges of liquidity excesses in highly inflationary periods.

The evolution of open market operations was also a result of the CBB's active role in facilitating the growth of the secondary market. By adopting securities designed to meet the market needs and, by providing liquidity support to market participants, the CBB was able to help foster a deep and broad secondary market and manage liquidity flexibly. Monetary management was further facilitated by the introduction of central bank bills, and the separation of responsibilities of the fiscal and monetary authorities.
II. Indonesia

Over the years, Indonesia introduced various monetary instruments to control liquidity and to manage a variety of balance of payments problems. While it initially relied on direct instruments of control, market-oriented instruments were introduced to respond to massive capital movements and foreign exchange reserve changes. A full transition to open market operations, however, was slow due to problems associated with the design of monetary instruments and the absence of a broad and deep secondary market.

Reacting to the first two oil shocks that fueled sharp expansions in bank liquidity and reserve money, Bank Indonesia (BI) relied on an array of direct monetary controls including reserve requirements, bank-specific credit ceilings, controls on the interest rate applied by state-owned banks, and management of liquidity credits. 1/

This system of credit controls did not succeed in curbing the surge in money supply and inflationary pressures. Bank-specific credit ceilings, used as a means of limiting the expansionary effect of growth in liquidity credits, resulted in commercial banks' accumulation of large amounts of rupiah excess reserves and of foreign exchange. In a response to the absence of investable financial securities, banks invested a significant portion of their surplus funds abroad, which also served as a hedge against foreign currency deposits maintained by their domestic customers. 2/ 3/

By the early 1980s, capital outflow became the main vehicle for the restoration of money market equilibrium, leading to a rapid deterioration of the net international position of the country.

In 1983, BI abandoned direct instruments of monetary control altogether and initiated a series of financial reforms to substitute indirect for direct monetary instruments. These reforms included the removal of interest rate controls on state banks, elimination of bank-specific credits, streamlining of access to BI's liquidity credits, establishment of two discount facilities, and introduction of market operations for controlling reserves in the banking system.

1/ State banks, extending credit to priority sectors, were eligible for liquidity credits from BI at highly subsidized rates and for a varying proportion of the loan, depending upon the type of loan. By end-1982, loans supported by these liquidity credits accounted for nearly 80 percent of total commercial bank credits.

2/ Indonesia maintained a policy of open capital account with almost no restrictions on capital movements combined with a managed floating exchange rate regional.

3/ The commercial banks' share of the banking system's net foreign assets rose from 8 percent at the end of the 1977 to 52 percent by mid-1983.
In February 1984, continuing those reforms, BI introduced its own certificates of deposits, Sertifikat Bank Indonesia (SBIs), aimed at absorbing reserves. SBIs' maturities ranged from 30 to 90 days and were issued initially on tap, but later at weekly auctions. BI determined the volume of the SBIs to be auctioned and set the cut-off rate. 1/

The transition to open market type operations required strong actions by BI. In an effort to provide banks with safety valves and support its own market operations, BI established two discount windows. The first intended to provide short-term lending of up to two weeks to help banks' day-to-day fund management; while the second provided funds for up to two months for banks with longer term liquidity shortages. Access to these facilities were limited to assure better control through market operations and to help develop a more active interbank market.

BI also took several measures to make SBIs attractive. It reduced the rate of interest it was paying on bank's excess reserves deposits. 2/ In a move to encourage the development of a secondary market, in February 1985, BI appointed a discount house, FICORINVEST (FICOR), to become the market-maker for the SBIs. 3/ FICOR was allowed to discount SBIs at the same interest rate they had when originally issued, regardless of the remaining maturity. In turn, FICOR rediscounted the SBIs at BI at the same original issue rate.

Despite BI's efforts, the SBIs did not become a very effective instrument of open market operations for several reasons: First, the interest rates on these instruments did not reflect true market rates since the cut-off rates set by BI for the SBIs were often below the interbank rate. Second, purchasers mainly held SBIs to maturity or discounted them at FICOR, preventing the development of a secondary market in these instruments. Third, FICOR was far from being a private financial firm operating independently in the money market. Instead, it was an agent of BI and was almost completely owned by it. Lack of independent private market makers in the SBIs may have contributed to the underdevelopment of a market for these instruments. Fourth, although FICOR was the SBIs dealer, it did not quote two-way prices for those securities. Indeed, lack of dealers who would provide two-way quotations limited the development of a bona fide secondary market in the SBIs.

Indonesia lacked deep and broad money markets in other instruments. Because of a constitutional prohibition on Government domestic borrowing, there were no government debt instruments. Also, the interbank call loan 1/ BI did not purchase SBIs prior to maturity. 2/ Interest on excess reserves was eliminated later. 3/ FICOR is almost 100 percent owned by BI.
market was relatively small as the existence of credit ceilings and liquidity credits had resulted in sizable excess liquidity in the system. 1/

It soon became apparent that BI needed another instrument to have the flexibility necessary to add reserves into the banking system, and to provide for the long term growth of liquidity by means other than its discount windows. Accordingly, in February 1985, BI introduced a new short-term money market instrument, SBPUs, that had the characteristics of both commercial paper and a banker's acceptance and were intended to provide an additional source of funds for the banking sector. There were two principal types of SBPUs: the first type was comprised of promissory notes issued by banks customers in connection with borrowing from financial institutions and by financial institutions in connection with interbank borrowing; the second type included trade bills, issued by third parties and endorsed by financial institutions, in connection with specific transactions. BI held daily auctions of SBPUS with maturities ranging from 7 to 360 days.

To expand the volume of trading in SBPUs and to encourage the development of a secondary market, BI appointed FICOR to act as an agent of BI and stand ready to rediscount, purchase and sell SBPUs. Banks discounted SBPUs at FICOR, who rediscounted those securities at BI, often at rates below the basic discount rate. 2/

Between 1988 to 1990, BI undertook further deregulatory measures that helped the growth of financial products and services. These included, inter alia, elimination of ceilings on interbank loans equivalent to 15 percent of bank's nonbank liabilities, reduction in the number of sectors eligible for liquidity credits, increase in interest rates charged on these credits, reduction of reserve requirements from an estimated effective rate of 11 percent to 2 percent of deposit liabilities, imposition of reserve requirements on nonbank financial institutions, and introduction of daily auctions of one-week RPs in SBIs or SBPUs. Longer term SBIs were introduced with maturities ranging from 7 days to 365 days. To offset the substantial excess reserves created by the change in reserve requirements, banks were required to invest the released reserves in special SBIs with three-to-six-month maturities. 1/ 4/ In October 1988, BI designated 16 institutions (9 private banks and 7 nonbank financial institutions) to participate in the weekly auctions and act as market makers in the secondary market. In

1/ There was also a market for negotiable certificate of deposits but until the interest rate liberalizations in 1983, this market was quite limited.
2/ Under special circumstances, financial institutions were also authorized to rediscount SBPUs directly at BI.
3/ Over time much of the liquidity was returned to the banking system, resulting in rapid growth in reserve money in the early 1990s.
4/ This arrangements meant that BI was indirectly paying interest on excess reserves.
December 1993, to support the marketability and credibility of the money market instruments, an independent rating agency (PT. Pefindo) was established. Finally, in part because of the heavy speculative attacks on the rupiah, BI shifted from interest rate targeting—adopted after the financial reforms in 1983—to targeting international reserves in the late 1980s.

International capital flows and macroeconomic instabilities in the late 1980s exerted considerable pressures on BI's monetary management that required coordination between open market operations and exchange policies. Tight monetary policy through high interest rates on SBIs and SBPUs resulted in significant capital inflows leading to an increase in foreign exchange reserves. Swap facilities, provided by BI for the purpose of sterilizing capital inflows, further exacerbated the problem as the stickiness of the auction yields—created by imperfect auction process—resulted in persistent arbitrage opportunities. 1/ Banks financed high levels of lending mainly through offshore borrowing that was transacted mainly through BI's own swap facility. Thus, while domestic interest rates rose, the rate of domestic credit expansion remained high. Attempts at sterilizing capital inflows led to further sales of SBIs and continued high domestic interest rates, leading to more inflows. In July 1995, BI abolished its swap facility.

In conclusion, BI made significant advances in the use of open market type operations as its main instrument of reserve money management. Its operations in the secondary market, however, remained limited mainly due to the lack of a sufficient supply of securities designed to meet market needs, absence of a computerized depository institution and custody service, and frequent changes in auction procedures. Macroeconomic instability and shifts in international capital flows also helped generate large fluctuations in demand for securities. The widening of banking networks, growth of capital market activities, increased market-based monetary instruments and improvements in clearing and settlement procedures are expected to stimulate the development of a more active secondary market in Indonesia in the future.

1/ BI set swap premia administratively.
III. Mexico

The full transition to open market operations from more direct instruments of monetary control in Mexico was successful but slow. The chief reasons for this sluggishness were the subordinate role of monetary policy to fiscal management, the unwillingness of the Government to move to a market-based debt management techniques, the lack of sufficient operational independence of the monetary authorities and delays in financial liberalization.

Prior to the 1970s, the monetary authorities pursued a policy of open capital accounts with a virtually fixed exchange rate. The Bank of Mexico (BOM) was obliged to keep inflation within a range similar to that in the U.S. Such policy implied imperfect control over the money supply or the rate of interest. Meanwhile, fiscal policy was the main tool for economic stabilization. Given a weak market in government debt, the burden of deficit financing therefore fell on the BOM and external borrowing.

The BOM used quantitative credit controls, restrictions on deposit and lending rates, directed lending to special sectors, and most importantly, a complicated system of multiple reserve requirements (with ratios of close to 50 percent depending on the types of deposits and institutions) to affect monetary conditions. It also allocated credit administratively and changed reserve requirements frequently. The direct credit allocation also served to finance public sector deficits. 1/

These traditional instruments, however, proved inadequate and inflexible in face of a worsening economic situation. In the 1970s, large Government expenditure resulted in significant increases in both internal and external debt. Between 1971-1976, the fiscal deficit grew from the equivalent of 2.3 percent of GDP to the equivalent of 9.1 percent of GDP, which fueled a sharp increase in inflation (from 5.3 percent to 27.2 percent in the same period). In that context the pegged exchange rate regime resulted in a sizeable real peso overvaluation, which contributed to the growing pressures on the current account deficit. Interest rate controls further exacerbated the situation. The result was a massive capital flight and finally a large devaluation against the U.S. dollar (about 38 percent) in 1976.

Faced with a sharp drop in external financing, the authorities aimed at finding additional domestic sources of financing the growing Government deficit. Thus, in January 1978, the BOM began auctioning Certificates of the Treasury (CETES), issued by the Ministry of Finance (MoF). 2/

1/ For example, banks were required to lend at least the equivalent of 50 percent of their deposits to the public sector.
2/ CETES were denominated in pesos and had a maturity of 90 days.
The primary objective of the CETES was to finance the growing deficit and not to control monetary conditions. Thus, the BOM only played an advisory role, while the MoF had the final authority concerning the terms of primary issues, including the volume, interest rates, and maturities. The BOM, however, did participate in auctions to purchase CETES for its own portfolio to be used for monetary sterilization. It also purchased a limited portion of CETES in post auction sales. Proceeds from later sale of CETES were placed in a renumerated frozen special deposit account. The Government could only use the funds in that account to buy back securities sold to the BOM. 1/

Meanwhile, to facilitate the development of a well-functioning money market in general and the market for government securities in particular, the authorities implemented several measures. These measures included simplification of reserve requirements, relaxation of controls on lending rates, and the promotion of multiple service banking. The result was the appearance of a range of new government and private securities, such as petro-bonds, commercial paper, banking acceptances, and convertible bonds, that greatly enlarged market instruments.

The BOM also established a centralized depository institution which featured a computerized settlement and custodial system. This service helped reduce operational costs, speed transactions and facilitate the growth of an interbank market in CETES and other financial instruments. The authorities also granted special dealer privileges to the authorized brokerage houses (casas de bolsa) to participate in the auctions for CETES; Commercial banks were prohibited to participate in those auctions. 2/

Notwithstanding the above measures, progress toward achieving fully market-oriented monetary policy featuring open market operation was slow. CETES operations remained quite small. The MoF set yields on CETES at very low levels to reduce the cost of financing the deficit. In such an environment, the BOM continued to use bank-specific credit controls and changes in reserve requirements as its main tools of monetary control.

The continuing policy of fixed interest rates and fixed but adjustable exchange rates, combined with a rising public sector deficit, monetary expansion, a deterioration in balance of payments due to large private borrowing from abroad, and inflation precipitated a second round of devaluations of the peso (equivalent to 40 percent) and a moratorium on debt payments to external sources in 1982.

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1/ See Alexander, Bálânó, and Enoch (1995).
2/ The prohibition of banks from having dealer privileges contributed to an increase in the nonbank intermediation's share in the total liabilities of the financial system.
In the aftermath of the 1982 debt crisis, the BOM again placed special emphasis on further developing the market for domestic government securities. In 1982, it changed its auction procedures to allow participants to bid competitively for the interest rates while the volume and maturity of securities were decided in advance by the MoF. This change of procedure to a more market determined interest rate combined with a growing demand by investors for short-term liquid instruments (as a hedge against inflation) resulted in a rapid development of the market for CETES.

By the mid-1980s, the secondary market in CETES was broad enough so that the BOM was finally able to give pre-eminence to open-market operations of CETES in the secondary markets. By this time, the market flow of funds for investment in government securities had become large enough to allow the BOM insulate its monetary policy from the government's debt management operations. With this aim in mind, the BOM expanded its range of monetary instruments to include RPs and RRPs in CETES, outright purchases and sales of securities, and auctions of credit in the interbank market. 1/

It was not until April 1989 that the Government began introducing a series of financial reforms to remove almost all impediments to the development of a market-based money market. Prior to that time, despite the increased reliance on open market operations for monetary control, the BOM had continued using quantitative restrictions such as reserve requirements, compulsory channeling of resources, artificial management of interest rates and restrictions on credit expansion.

The reform measures included, inter alia, replacement of reserve requirements on bank deposits by a 30 percent liquidity ratio on peso liabilities, to be held in the form of government securities and cash deposits at the BOM; 2/ removal of all controls on interest rates and maturities on all traditional bank instruments and deposits; authorization of issuance of bankers acceptances with unregulated terms and interest

1/ For a brief period in 1985, the BOM changed its auction procedures for CETES back to fixing the yields because of the increase in the market determined interest rates. This action resulted in a sharp fall in demand for CETES, resulting in yet another reversal of procedures in July 1986.

2/ Faced with banks' increasing difficulty to meet their liquidity requirement on domestic currency deposits, the authorities reduced the liquidity coefficient from 30 to 25 percent. To prevent disruptions in financial markets from a sudden sale of bank holdings of government securities in excess of newly required amounts, these excess holdings were exchanged at maturity for three- or ten-year BONDES (defined below). The liquidity coefficient was finally abolished in 1993.

3/ Since 1993, commercial banks are allowed to close any shortages or surpluses emerging from the results of the Clearing House by 9 am of the immediately following working day. This system allowed banks to reduce their deposits with the BOM considerably.
rates; 1/ elimination of restrictions on bank lending to the private sector; removal of mandatory lending at below market interest rates to the public sector by commercial banks; 2/ and finally, permission for banks to participate in auctions for government securities on behalf of themselves and their customers. Banks were allowed to run an overdraft in their correspondence accounts with the BOM for one day in exchange for a service fee related to the interest rate on CETES. Foreign exchange controls were completely abolished by end-1991.

The deregulation of interest rates, removal of quantitative credit controls and development of broad and deep money market enabled the BOM to undertake its monetary policy to conduct monetary policy through open-market operations. In this context, the BOM redefined its primary policy objective as attaining price stability and focused on the control of the monetary base as the intermediate variable most likely to bear a stable relationship with prices. Since the exchange was kept within a band (consisting of a fixed floor and a depreciating ceiling), to the extent that the accumulation of international reserves implied an excessive supply of money, the BOM reduced its domestic credit and fine-tuned the liquidity conditions in the secondary market. The BOM also continued to operate its emergency lending facility, although demand remained low.

In the late 1980s, a series of new inflation and exchange rate-indexed government securities were issued that allowed the BOM to further broaden its open market operations. The new securities included fully tradable Treasury Notes (PAGAFES), Development Bonds (BONDES), Treasury Bonds (TESOBONOS), government Indexed Bonds (AJUSTABONOS). 2/ The result was an increase in the variety of options offered to the public, the lengthening of the maturity of government debt and a reduction in the importance of CETES in open-market operations of BOM. All the above government securities except petrobonos were issued by the MoF and were placed by the BOM at weekly auctions.

1/ Prior to this time, there was a 100 percent reserve requirement against bankers' acceptances issued beyond an authorized limit. As of 1988, all bankers' acceptances were subject to the restriction of maintaining a liquidity ratio of 30 percent in the form of government debt securities and/or interest bearing deposits at the BOM.

2/ At the time, banks were required to channel at least 50 percent of these deposits to the public sector (inclusive of reserve requirements).

3/ PAGAFES are dollar denominated treasury bills with maturity of 28 days to 1 year payable in pesos at a fixed exchange rate. BONDES are peso denominated treasury bills with maturity of one to two years that carry adjustable-rates and are indexed to inflation. TESOBONOS have maturities of one-to three-months and are quoted in pesos with returns indexed to the rate of exchange between peso and dollar. AJUSTABONOS are indexed to the National Consumer Price Index and have a maturity of 3 to 5 years.
A new coordinating arrangement was set up between the monetary and fiscal authorities. The amount of weekly government debt auctions, timing of new issues, range of securities, maturity dates, and issue prices began to be determined by both the financing needs of the Treasury and monetary policy considerations rather than only by the former. The BOM continued participating in auctions to purchase CETES for its own portfolio. Decisions about the volume of issuance of government securities were made in coordination between the BOM and the MoF. The BOM announced each Friday the securities and maturities to be auctioned the following week. Yields were allowed to be market determined, although the BOM intervened frequently to smooth erratic fluctuations through both outright operations and RPs and RRPs.

One significant result of the evolution of the market for domestic public debt was the decline of monetary assets in relation to other financial assets. M2 declined substantially though gradually, from over 90 percent before 1982 to between 50-60 percent after 1989. Also the composition of the domestic public debt shifted. The share of CETES-(the primary government security used for open-market type operations in the early stages) declined from the equivalent of over 89 percent of the total value of government bonds in 1987 to 42 percent in 1991, while the share of the longer-term Bondes increased from 1 percent to 34 percent during the same period.

Mexico entered a new crisis in end-1994 as the peso was devalued by about 15 percent, and eventually a new regime of floating exchange rate regime was adopted because of market pressures and significant capital outflows. The crisis was fueled by several developments, including large net capital inflows in the early 1990s, the concentration of government debt with short term maturity, a widening current account deficit, the shift in the Government’s financing strategy which entailed a significant switch from peso-denominated CETES to Tesobonos that were indexed to the peso-dollar exchange rate, sterilized intervention, increase in net domestic assets in response to capital outflow, and political uncertainties.

In the aftermath of the currency crisis, the BOM introduced some changes to its monetary policy operations. First, since April 1995, it renewed emphasis on the credit auctions with maturities of 1 to 60 days. As of then, credit auctions have been collateralized with government’s

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1/ M1 = currency held by the public plus demand deposits;  
M2 = M1 plus other short-term bank deposits and banker’s acceptances.  
3/ Tesobonos accounted for only 6 percent of total Mexican debt at end-February 1994. By end-November 1994, these instruments accounted for 50 percent of the value of all securities outstanding.
securities and bank papers. Banks may use uncollateralized credit only at a penalty rate. Second, the maturity of CETES was increased to 180 and 360 days, with a view to reduce reliance on the short-end of the market. However, this policy was not successful as the public continued to demand shorter-term instruments.

Overall, the development of open-market type operations, the growth of the money market, financial liberalization and the implementation of monetary policy through indirect instruments were not independent developments in Mexico. Rather, they reinforced one another, although there were some lags between them. For instance, open-market type operations were introduced and the money market in government securities grew even before the full liberalization of interest rates and elimination of direct methods of monetary control. It was, however, the combination of financial liberalization, financial innovation, and the large supply of government securities designed to meet market needs that allowed the BOM to eventually control liquidity with full-fledged open-market operations. A computerized depository institution and custody service, a competitive auction system, and close coordination between the BOM and the MoF operations facilitated this process.

\[1/\] Previously, CETES were being issued with maturities of 14, 28, 91, 181, and 360 days, but more recently the maturity range includes only 28 and 91 day securities.
IV. Philippines

Despite significant advances made by the Central Bank of Philippines (CBP) toward open market type operations, transition to full-fledged open market operations has not yet taken place. The delay in the transition can be attributed to several factors, including shifting policies regarding the issuance of government securities, a thin and underdeveloped market, and the lack of supporting arrangements between the MoF and the Central Bank of Philippines (CBP).

The first move toward open-market type operations began in 1966 with weekly auctions of Treasury bills intended to provide non-inflationary financing for Government expenditure. 1/ To promote a market in these securities, the CBP established a network of accredited government securities dealers to enter bids in the weekly auctions of primary issues, distribute securities, provide two-way quotations, and submit all reports required by the CBP. Dealers were conferred certain privileges, such as waiver of deposit requirements for tenders, and as of 1974, access to special inventory financing through a RP window with the CBP, and an exclusive right to purchase and sell CBP holdings of government securities.

By the early 1970s, the money market grew so rapidly that the authorities issued various regulations to bring it under the Government’s supervision. 2/ The authorities felt that measures were necessary to protect the investing public and stop the diversion of funds from the longer-term markets and the domestic banking system. 4/ These measures included, inter alia, fixing the maximum yield on short-term money market instruments and passing a law regulating investment houses. The CBP also began to require banks to hold government securities as part of their legal reserves, which depressed the yields on T-bills below those on other money market instruments. These measures resulted in a setback to the development of the money market in general and the T-bill market in particular. By 1973, trading in these bills almost disappeared.

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1/ These bills had a maturity of 91 and 182-days.
2/ Prior to the shift to market operations, frequent changes in reserve requirements, rediscount facilities and controls of interest rate were among the main instruments of monetary management. Government securities were issued on tap but generally carried extremely low interest rates, resulting in low demand.

3/ The main components of this market included, inter alia, the interbank call loan, the T-bills, promissory notes, other government securities, and commercial paper.

4/ The rate on some securities were higher than the controlled interest rates on banks’ deposits.

Meanwhile, in 1970, the CBP began issuing on tap its own medium-term securities, Central Bank Certificates of Indebtness (CBCIs). 1/ Originally intended to mop up excess liquidity stemming from a commodity export boom, the proceeds were to be channelled from urban to rural areas in support of the country's agricultural programs. The CBCIs, however, were not particularly effective for open market type operations since they were medium-term securities and carried fixed interest rates.

The CBP was relatively more successful with its RP operations. 2/ The CBP introduced its RP window in 1974. There were at least three main types of operations involving RPs: bank borrowing to acquire liquid funds—mainly to meet reserve requirements and clearing balances, CBP accommodation of government securities dealers to finance their inventory, and CBP open market operations via RPs and RRPs to inject or drain liquidity into the system. The underlying instruments for RP transactions were T-bills, CB bills and to lesser extent, commercial papers. The CBP interest rates on RPs was related to T-bills yields and interbank call loan interest rates.

In the early 1980s, the authorities embarked on an extensive liberalization and deregulation program by abolishing most direct credit controls. During this period, the CBP removed all interest rate ceilings on savings and time deposits, and eliminated capital controls. Ceilings on bank relending rates were also lifted in line with the deregulation of interest rates. The only remaining direct control was the requirement that banks set aside a certain portion (25 percent) of the loanable funds for lending to priority sectors, including agricultural and agrarian reform credits. 3/ 4/

In an effort to strengthen its market operations, in 1984, the CBP reduced the number of its rediscount windows to just two windows, one for agricultural production credits and another for general purpose credits. A

1/ The CBP shifted to auctioning of CBCIs in 1978.
2/ Authorized dealer banks were allowed to enter into RPs with the CBP on their holdings of T-bills as early as 1968.
3/ The removal of capital controls resulted in serious pressures on interest rates because of the expectations of future devaluations of the peso. By 1986, real lending rates reached nearly 20 percent annually.
4/ Notwithstanding the interest rate liberalization efforts, the CBP opened 16 discount windows for various economic sectors between 1981-1983 with prescribed maximum lending rates significantly below the market rates. Indeed, the CBP enlarged the scope of its selective credit program, since many economic activities could qualify for rediscounting. Attractive spreads between the discount and loan rates encouraged private banks to borrow from the CBP rather than from the money markets. The increase in the CBP's lending was so dramatic that when it began tightening access to its rediscount windows in 1984, many banks found themselves illiquid.
new "lender of last resort" facility was also established for financial institutions encountering temporary liquidity problems.

Reserve requirements remained an active instrument of monetary control, mainly because the CBP often lacked sufficient securities in its portfolio to carry out the large amount of liquidity absorption necessary. These requirements were changed as needed. Over time, they were lowered considerably, but their continuing high levels resulted in severe financial disintermediation and significant growth of off-balance sheet bank deposits. 1/

With the removal of capital controls and the adoption of a floating exchange rate system in 1984, the CBP’s monetary target was also changed from net domestic assets of the central bank to base money. The change reflected the importance the CBP attached to arresting inflation as well as containing possible substantial, unanticipated capital inflows.

Following the financial reforms, the CBP began to issue its own short-term securities, the CB bills. 2/ The move was prompted by the insufficient stock of T-bills in the CBP’s portfolio and lukewarm investors’ interest in the CBCIs. Also, the CBP needed a flexible instrument to carry out large liquidity absorption to counter the inflationary pressures of the oil price shock and a balance of payment crisis in 1984.

The new CB bills had maturities of less than one year, were sold at a discount and on a negotiated basis. They carried market determined rates, and could be used in RPs with the CBP but not to fulfill reserve requirements. The CB-bills succeeded in enabling the CBP to absorb successfully substantial amounts of bank liquidity.

By end-1986, however, the CBP suspended its monthly auctions of CB bills in favor of T-bill auctions. The authorities felt that CB-bills were competing with T-bills in a thin securities market. Moreover, the CBP viewed the concurrent sale of both bills as complicating the monetary and financial reforms.

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1/ To avoid high reserve requirements, banks shifted deposits to Common Trust Funds (CTFs), to finance their purchases of government securities. These CTFs were largely outside the direct control of the CBP. As it turned out, the CTFs often grew at a faster rate than broad money. In 1992, off-balance sheet liabilities equaled about one-third of balance sheet liabilities. The CBP imposed a 10 percent reserve requirements on CTFs in October 1993.

2/ The CBP suspended auctions of T-bills but continued placing them in the market on a negotiated basis.
domestic debt policies. In addition, sales of central bank liabilities at market interest rates were contributing to already significant CBP losses. 1/

The deteriorating financial condition of the CBP combined with a need to sterilize large capital inflows--stemming from improved confidence, foreign exchange liberalization and sizable interest rate differentiation--led the CBP to resume weekly auctions of T-bills. The CBP also removed the requirement placed on commercial banks of satisfying their reserve requirements through holdings of the T-bills.

In addition, a new arrangement was established between the CBP and the MoF. It required the MoF to float T-bills in amounts over and above MoF’s financing requirements, so as to allow the CBP to use the T-bills also to conduct monetary policy. Proceeds from the sale of the “excess” T-bills were placed in a fixed-term deposit account with the CBP on which the CBP paid market interest rates. The arrangement was originally intended to allow the Government to offset the expansionary effects of the phaseout of CB bills in favor of T-bills. Since then, the arrangement has actively been relied upon to meet monetary targets. 2/

Currently, the CBP conducts open market operations through a mix of instruments including outright transactions in government securities and regular and overnight RPs and RRPs. 3/ It also uses, on an irregular basis, changes in reserve requirements, variations in the discount rate, and occasional issuance of CB bills to affect liquidity. The latter has depended on the Government’s commitment to bring the volume of T-bills fully in line with monetary management requirements. The CBP also lends to banks on a very short-term basis through overnight RPs. The CBP is not allowed under its charter to participate in the primary market. It, therefore, purchases its securities in the secondary market. Often it has had some difficulty in doing so, however, as that market has remained thin.

1/ The combination of foreign exchange swaps, forward cover operations used to combat capital inflows, and restructuring of a number of weak commercial banks resulted in losses for the CBP averaging more than 2 percent of GNP since 1982.

2/ In 1993, the CBP was restructured, its non-income earning assets and debts were assigned to a new entity, and a new central bank was created, the Bangko Sentral ng Pilipinas (BSP). The new BSP received broad portfolio of treasury securities to better undertake open-market operations.

3/ Activities in the RP market declined in the mid-1980s because of the CBP imposition of various taxes on RP transactions, the imposition of reserve requirements for bank RP borrowing (except for RP transactions with the CBP), and the suspension of the CBP window operations from 1984 to 1986. As a result, the volume of activity in 1989 was equal to only 2.5 percent of the peak volume in 1983. The market has subsequently been revived.
In conclusion, over the years, Philippines made significant progress toward using both open market type operations and full-fledged open market operations. Extensive financial reforms, establishment of a competitive auction for securities, creation of a network of dealers as market makers, provision of liquidity support, and removal of reserve eligibility of T-bills facilitated this progress. Market transactions in securities were also greatly aided by the introduction of a book entry system in 1989. 1/

The development of a deep and broad secondary market was often slowed, however, by the erratic policies regarding market operations, delaying the CBP's transition to full-fledged open market operations. Policies such as the practice of shifting between issuance of Treasury and central bank securities, fixing yields on RPs, and overregulating the money markets greatly hampered the development of active secondary market in securities. Insufficient supply of securities eligible for RRPs also helped limit the use of open market operations. Adverse macroeconomic conditions further hindered the full transition to open market operations. Economic instability, high fiscal and balance of payment deficits and volatile of interest rates in response to changes in inflation limited the development of the market for long-term instruments. 2/

1/ The CBP plans to introduce a central depository for securities by the end of 1995. Starting in 1996, all security transactions are expected to be cleared through a new centralized clearing system. Progress in developing the supporting institutional infrastructure is expected to help create a deeper and broader secondary market.

2/ For example, money market activities declined sharply after the economic crisis of 1983 and only began to rise around 1988. Much of the recovery in the market reflected increased issues of government securities due to the Government's need to finance its large budget deficit.
APPENDIX II

V. Poland

Poland successfully adopted open market operations as its main instrument of liquidity management within a relatively short period of time. The swift transition to operations in the secondary market from more rudimentary direct controls can be attributed to several factors including inter alia, financial reforms, introduction of short-term monetary instruments that carried market related rates, sufficient securities, proper coordination between different monetary instruments, an efficient clearing, settlement, and payment system, and development of a broad and deep secondary market.

Until 1989, the National Bank of Poland (NBP) drew up an annual credit policy, specifying total credit expansion and credit ceilings for the individual state owned banks. To conduct monetary policy and provide preferential credit at the same time, the NBP also controlled the volume of refinancing credit through quantitative ceilings and the refinancing interest rates by engaging in refinancing credit agreements with individual banks. 1/

As Poland moved to a decentralized market oriented system, the NBP undertook a series of reforms to deal with a large fiscal deficit (over 6.5 percent of GDP in 1991) financed primarily by the banking system and a high annual average rate of inflation (over 70 percent in the same year). A central feature of the reform was the devolution of the commercial banking functions of the NBP to nine commercial banks, while the new NBP was left mainly with traditional central banking functions. The NBP began adopting a more active monetary policy of restraining credit expansion rather than merely accommodating the state budget or price and output developments. The NBP also liberalized interest rates and introduced reserve requirements, frequently adjusting the latter to absorb excess liquidity in the system.

To improve monetary control, help develop the interbank market and pave the way for open market operations, the NBP streamlined the structure of its lending facilities. As of January 1990, the NBP began adjusting the basic refinancing rate on a monthly basis, better reflecting the current conditions of the market and the economy. The structure of penalty interest rates for bank overdrafts on their current accounts with the NBP was also streamlined. The NBP also set up a Lombard credit facility that extended collateralized loans (up to three months) and provided refinancing against the collateral of eligible bills. Moreover, the NBP encouraged banks to rediscount special agricultural bills in the hope that those bills could be used as collateral for interbank lending, thereby reducing banks' dependence on NBP refinancing.

1/ A relatively minor instrument was a "payments credit" facility, that was linked to the outstanding amount of basic refinancing and was used by banks to meet temporary shortages of liquidity. Banks' recourse to this facility was automatic but involved a penalty interest rate.
In 1990, in an effort to reduce liquidity in the banking system and dampen inflationary pressures, the NBP introduced weekly auctions of its own debt instrument, one-month NBP bills with fixed interest rates. These bills were auctioned to banks, firms, and individuals. The NBP offered rediscount for these securities with up to three months to maturity. It offered early redemption of its bills, but at a high penalty discount rate. 1/ The short-term maturities of the bills were attractive to investors at a time when Poland was experiencing high inflationary expectations. 2/ Thus, the initial demand for one-month NBP bills was quite strong.

Notwithstanding the success of the NBP bills, the authorities needed another instrument to not only finance the budget deficit through non-inflationary means but also develop a secondary market large enough to undertake full-fledged open market operations. Thus, the NBP began auctioning Treasury bills in 1991. Initial issues were relatively small; auctions were conducted weekly, and bill maturities ranged from 4 to 56 weeks. 3/

The authorities auctioned tradeable securities at various maturities to establish a market-based yield curve. These securities included, inter alia, a one-year government bond indexed to inflation and a three-year floating rate bond linked to the three-month T-bill rates.

A secondary market in T-bills developed rather quickly. It was favored by the NBP's appointment of more than 20 primary dealers (banks and other financial institutions) which quoted buying and selling prices for all government securities on request. Primary dealers were required to participate in the auctions, distribute securities, provide two-way quotations, and have sufficient capital to cushion them against risks associated with transacting in the market. Also dealers agreed with commercial banks to transact securities with households through banks' branches on behalf of the dealer.

The NBP, in turn, provided liquidity support by giving the dealers the privilege of access to special dealer financing facilities of the NBP. During the initial stages, the NBP also provided financing, to dealers, at the dealers' initiative, through its Lombard facility.

The above NBP efforts combined with the growing volume of outstanding securities that were widely distributed among a large number of holders helped foster the development of the secondary market in T-bills over a

1/ The 30-day NBP bills were later discontinued and were replaced with a 91-day bill to allow for the development of a market in T-bills.

2/ Also, interest income from these NBP bills were tax exempt.

3/ With the introduction of one-month T-bills, and the subsequent switch to three-month NBP bills, the demand for NBP bills dropped significantly.
period of less than four years. By eliminating interest payment on excess reserves, and banning commercial banks to use T-bills to satisfy reserve requirements, the NBP provided the banks with further incentives to purchase government securities and engage in trading. The NBP also began phasing out its own NBP bills so as not to segment the market for domestic securities. Finally, the NBP reduced commercial banks access to its short-term refinancing credit facility.

To further shore up trade in the secondary market, the NBP introduced a screen-based information system, "NBP Telegazeta" at its own headquarters for quoting bid and offer prices, of both NBP and T-bills. Banks as well as other investors, including enterprises and individuals could participate in this system. Participants sent their bids which were communicated to the headquarters by facsimile. The system displayed best prices quoted. It facilitated trade in government securities by matching trades on the screen. The NBP provided settlement services for the matched trades through its branch network.

The NBP began actively managing aggregate bank reserves through the conduct of open market operations. In 1991, it shifted from issuing credit on tap to auctioning RPs at the initiative of the NBP. The shift was intended to improve the management of the banking system liquidity by providing the NBP instruments to operate at its own initiative. The RPs were fully collateralized and their maturities ranged from 1-14 days. The NBP’s operations in RRsPs helped significantly reduce excess liquidity, which had created a very steep positively sloped yield curve in the short-term money market. By 1993, open market operations in both RPs and RRsPs grew in size and importance to such an extent that the NBP conducted its monetary policy mainly through its weekly operations with the primary dealers.

Poland like many other countries in transition faced serious problems regarding its payment system that, unless solved, would have hampered the development of an interbank market and the use of open market operations for monetary purposes. These problems included a large and volatile float, unreliable timing of execution of payments orders, and inefficiencies caused by multiple clearing accounts and unreliable clearing arrangements. To alleviate these problems, the NBP took significant measures including consolidation of banks’ clearing accounts into a single centralized account per bank, establishment of a National Clearing House as a private company with joint ownership of commercial banks and the NBP, implementation of a system of overnight clearing and settlement of paper documents, and establishment of the Interbank Settlement Department to manage and oversee

1/ The NBP also conducted auctions of repurchase agreements in NBP bills.
2/ The term float reflects differences in timing between crediting and debiting of accounts caused by delays in the transmission of payment information and in the subsequent registration of accounting entries. See Baliño, J. Dhawan and V. Sundararajan (1994).
the development of the interbank payments system. An electronic payment system was also developed to replace the paper transaction system. The result was a significant reduction in the amount of time necessary to clear and settle payments and a dramatic decline in daily float. Also as a result of the above mentioned efforts, in just a few years, the interbank deposit market grew to become a very active and broad market and the Warsaw Interbank Offer Rate (WIBOR) became an established benchmark for the cost of short-term funds. The WIBOR also became an important indicator of the state of liquidity in the money market.

Overall, Poland was able to move to open market operations by placing emphasis on extensive financial reforms, correct design of monetary instruments that featured market rates, coordination between the various monetary instruments, and a commitment to development of a broad secondary market. The NBP currently uses RPs and RRPs as its main instruments of monetary policy. To influence liquidity on a permanent basis or to counteract seasonal variability in liquidity, the NBP also conducts outright sale and purchase of T-bills. These operations are expected to gain further momentum with the introduction of the book-entry system in mid-1995.
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General


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