

IMF Working Paper

© 1997 International Monetary Fund

This is a *Working Paper* and the author(s) would welcome any comments on the present text. Citations should refer to a *Working Paper of the International Monetary Fund*. The views expressed are those of the author(s) and do not necessarily represent those of the Fund.

WP/97/144

INTERNATIONAL MONETARY FUND

Monetary and Exchange Affairs Department

Liquid Asset Ratios and Financial Sector Reform

Prepared by Anne-Marie Gulde, Jean Claude Nascimento, and Lorena M. Zamalloa¹

Authorized for distribution by Tomás J.T. Baliño and Charles A. Enoch

October 1997

Abstract

As a monetary, selective credit, and government debt-management instrument, a liquid asset ratio is generally inefficient and may introduce serious distortions. However, it may play a limited role as a prudential instrument, particularly in less sophisticated banking systems or in the context of currency board arrangements. Recent trends in the use of this instrument have been to either abolish it altogether or to design it so as to minimize distortions. When necessary, these changes have been part of a broader effort to make financial intermediation more efficient by relying more on markets and less on regulations.

JEL Classification Numbers: E52, E58, G21, G28

Keywords: Banks, Banking Regulation, Central Bank Policy, Monetary Policy.

Authors' E-Mail Addresses: AGULDEWOLF@IMF.ORG and LZAMALLOA@IMF.ORG

¹A shorter version of this paper was published in *Instruments for Monetary Management: Issues and Country Experiences* (IMF, 1997). Mr. Nascimento conducted research for this paper when he was an economist in the Monetary and Exchange Affairs Department. The views expressed are the authors alone and should not be attributed to the IMF. The authors thank Tomás J.T. Baliño, Daniel E. Dueñas, Charles A. Enoch, David Marston, Elizabeth A. Milne, Inci Otker and Mark W. Swinburne for helpful comments and Kiran Sastry for his research assistance.

Contents		Page
Summary		4
I. Introduction		5
II. Role and Effectiveness of Liquid Asset Requirements		6
A. As a Monetary Instrument		6
B. As a Selective Credit Instrument		9
C. As a Government Debt Management Instrument		10
D. As a Prudential Instrument		11
III. Transitional Issues in Reforming Liquid Asset Requirements		12
A. Analytical Considerations		12
B. Technical and Strategic Problems		15
C. Methods		15
IV. Country Experiences		17
A. The Use of Liquid Asset Requirements		17
B. The Design of Liquid Asset Requirements		19
C. Lessons From Experience in Reform		20
Institutional and macroeconomic conditions		21
Pace and approaches to reform		23
Supporting measures and reforms		25
Implementation experience		27
V. Conclusions		28
Text Tables		
1. How to Lower or Abolish a Liquid Asset Requirement		14
2. Macroeconomic Conditions During the Reform of Liquidity Requirements		22
3. Country Experiences During the Reform of Liquidity Requirements		24
4. Approaches to Reform		25
Charts		
1. Deposit Money Banks Share of Financial System Deposits		40
2. Deposit Money Banks Share of Deposit Liabilities		48

Appendices

1. Use of Liquid Asset Ratios (LARs) in Selected Countries	31
2. Selected Country Experiences in Reform	39
References	60

SUMMARY

This paper examines the role and effectiveness of liquid asset requirements as a monetary, selective credit, debt-management, and prudential instrument. As a monetary instrument, liquid asset requirements have a substantial monetary impact when banks satisfy this requirement by holding central bank liabilities or securities issued and negotiated abroad. Nevertheless, this requirement is generally an inefficient and redundant monetary instrument that may seriously impede the efficiency of the financial sector. As a selective credit instrument, liquid asset requirements have been used to allocate credit to the government, often at below-market rates. This introduces serious interest rate distortions that are likely to induce disintermediation from the regulated financial system. As a debt-management instrument, a liquid asset requirement will often give a distorted view of the government's real borrowing cost and may impede outright transactions of government securities. Therefore, from a monetary, selective credit, and debt-management standpoint, liquid asset requirements should be replaced by more market-based instruments.

As a prudential instrument, sophisticated banking systems—characterized by, among other features, greater reliance on foreign and domestic interbank markets—require more elaborate liquidity standards than static ratios. However, adequately designed, liquid asset requirements may have some advantages in less developed banking systems or when used flexibly as indicators in conjunction with other measures of liquidity. Moreover, they can make the banking system more resilient in contexts in which the monetary authority has limited lender-of-last-resort capabilities, such as currency board arrangements.

Abolishing or reforming the liquid asset requirement is most efficiently accomplished in a stable macroeconomic environment, in the context of sound fiscal policies and, if necessary, a broad financial sector reform package. In addition, the requirement should be reformed or phased out gradually, in line with the speed with which the authorities can introduce supporting measures. However, a more rapid reform is necessary when the liquid asset requirement is creating significant distortions in the banking system and contributing to banks' financial difficulties. At other times, reform may be accelerated if there are structural shortages of liquid assets.

I. INTRODUCTION

A liquid asset requirement, or ratio, is defined as the obligation of commercial banks to maintain a predetermined percentage of total deposits and certain other liabilities in the form of liquid assets. In a number of countries this requirement is calculated as a percentage of short-term liabilities. The eligible range of assets varies, but usually includes cash, deposits with the central bank, correspondent accounts, and government securities. This requirement may be maintained on a day-to-day or on an average basis.

Industrial countries have for the most part eliminated the use of a binding liquid asset requirement for monetary and prudential purposes.² In developing countries their use mainly reflects a mix of monetary and prudential purposes. Recently, this requirement has been used in the context of currency board arrangements as a prudential instrument to help banks meet their systemic liquidity needs, given the limitations such arrangements set on the central bank's ability to act as a lender of last resort. However, the general trend has been to reform this instrument with a view to improving banks' liquidity management. Reform has included lowering liquid asset ratios to the minimum level necessary to manage cash flows and facilitate interbank settlements, allowing for averaging of liquid asset balances and including among the list of eligible assets those that can be realized in a relatively short time without significant loss of principal.

Several problems have typically led countries to undertake such a reform. When eligible securities carry below-market returns, financial flows tend to be diverted to markets or institutions that are exempted from the ratio. Under such circumstances, liquid asset requirements lead to inefficiencies and disintermediation and become increasingly ineffective for monetary control. In any case, liquid asset requirements have a significant monetary effect only to the extent that the assets used to satisfy them are a central bank liability or are issued and negotiated abroad. But, from a monetary standpoint, a liquid asset requirement is an inefficient instrument that may introduce serious distortions.

Typically, reform of this requirement has been part of a broader effort by countries to make financial intermediation more efficient by relying more on markets and less on regulations. In the area of monetary management, this effort involved using indirect instruments of monetary policy such as open market operations instead of direct instruments such as interest rate controls or credit ceilings. In the area of public debt management, it involved greater emphasis on selling government debt at market interest rates. In the area of banking, this effort involved implementing structural reforms in banking, including banking supervision and bank restructuring, to enhance banks' efficiency in liquidity management and steps to enhance the effective implementation and transmission of monetary policy, including through streamlining the payment and settlement system.

²A binding liquid asset requirement forces banks to demand more liquid assets—namely, government securities—than they would in the absence of the requirement.

This paper reviews key analytical issues and central bank practices pertaining liquid asset requirements, focusing on their effectiveness as a monetary or prudential tool. As a number of countries have reformed or removed this instrument, the paper also examines transition issues in such changes. Based on general principles developed in the first part of the paper, case studies for five countries are used to extract lessons on how to best include the abolition of a liquid asset requirement into a wider financial restructuring program. The experience of countries under review suggest that reform is most effective and most smoothly accomplished under conditions of a stable macroeconomic environment and sound fiscal policies. In addition, a market-based Government debt strategy, a sound financial system and an adequate supervisory framework also facilitate a successful reform.

Section II examines the role and effectiveness of the liquid asset requirement for a variety of purposes such as monetary control, selective credit objectives, Government debt management and prudential control. Section III addresses transition issues in reform including the conditions which facilitate the reform, possible strategic and technical problems that could arise during the reform, and the approaches to removing or lowering the liquid asset requirement.³ Section IV examines the experience of selected countries with the use and design of these requirements; and, using the analysis presented in section III, reviews the experience of the five countries (Jamaica, Malaysia, Mexico, New Zealand, and Turkey) in reform. Finally, Section V summarizes the principal conclusions.

Detailed empirical material is presented in the appendices. Appendix I tabulates liquid asset requirements in selected industrial, developing and transition economies in relation to purpose, current status and special features. Appendix II contains case studies for the five countries listed above; these highlight the conditions which facilitate the process of reform in countries with differing financial systems and traditions.

II. ROLE AND EFFECTIVENESS OF LIQUID ASSET REQUIREMENTS

Liquid asset requirements have been used for both monetary and prudential purposes. In addition, the ability to ensure demand for certain financial instruments also makes such a requirement a selective credit instrument or even a debt-management instrument.

A. As a Monetary Instrument

Currently, the view that a liquid asset requirement is an inefficient monetary instrument is widespread. In the past, however, advocates of the credit availability theory claimed that the liquidity ratio could be used as a monetary instrument to control credit growth.⁴ Given that,

³Sections II and III draw in part from Gulde (1995).

⁴A brief summary of the credit availability and monetarist views is found in Alexander and
(continued...)

according to this view, private investment was responsive to changes in the availability of credit, an increase in the liquidity ratio would decrease credit and therefore dampen aggregate demand. Although this viewpoint assumes that there are no offsetting increases in government expenditure, it ignores interest rate effects. An increase in the liquidity ratio would cause an increase in private sector credit interest rates, but it would also cause a decline in government securities rates, thus providing incentives for additional government expenditure. As a result, the overall effect on aggregate demand is ambiguous.

Another strand of the credit availability literature postulated that a liquid asset requirement should be used to supplement a contractionary monetary policy (such as an increase in the cash reserve requirement) during an economic expansion.⁵ For instance, Dean (1975) has claimed that taxing the banks by forcing them to hold larger cash reserves may actually increase their desire to hold high-income loans rather than low-interest securities. To the extent that the deposits of borrowers had a greater income velocity than the deposits given up by the purchasers of bonds, the contractionary effect was frustrated. Thus, in his view, a liquid asset requirement was necessary to avoid this effect.

In contrast to the credit availability view, monetarists postulated that liquid asset requirements were ineffective for monetary control because the money supply, instead of bank credit, was the best indicator of the thrust of monetary policy. Consistent with this view, the supply of and demand for money determined the short-term money market interest rate. This rate, in turn, affected other market interest rates, which then affected spending and output. In this way, monetary policy worked by affecting bank deposits, not bank loans. Furthermore, monetarists asserted that it was unnecessary to impose a liquid asset requirement to supplement a monetary contraction during an economic expansion. Unlike Dean, they believed that depositors and bondholders both had the same income velocity. Therefore, to ensure a contractionary monetary policy, it was sufficient to increase the cash reserve requirement.

Given the importance of the money supply in the transmission of monetary policy, numerous writers have analyzed the impact of a change in the liquidity ratio on the money supply. For instance, Myhrman (1973) claimed that, in Sweden, the liquidity ratio did not have any significant effect on the money supply and was therefore ineffective. He argued that the direct effect of a higher ratio was a shift from loans to bonds in bank portfolios, leaving the money stock unchanged. In his analysis, private sector lending was reduced, but the reduction was matched exactly by the sale to banks of bonds held by the private sector.

(...continued)
Caramazza (1994).

⁵For the purpose of this analysis, the liquid asset requirement is defined as any portion of commercial banks' liquid asset portfolio net of required cash reserves (Dean 1975).

He also postulated that the indirect effects of an increase in the liquidity ratio on the money supply, such as the impact of changes in interest rates on the demand for currency and excess reserves, were small in absolute value.

Clark (1985) also analyzed the impact of a change in the liquidity ratio on the money supply. Although he argued that an increase in the liquidity ratio might actually lower the money supply, he was not able to corroborate his findings at the empirical level using data for Canada. In contrast to Myhrman, he gave much weight to the indirect effects on the money supply of raising the liquid asset requirement. The thrust of his argument was that by reducing the effective interest rate on the banks' portfolio, increasing the ratio would reduce the opportunity cost of holding excess reserves. Consequently, the demand for excess reserves would increase and this effect, working through the multiplier, would help reduce the money supply.

Still another author (Hörngren, 1985) postulated that the impact of an increase in the liquidity ratio on the money supply was at best uncertain and possibly perverse in that it might lead to a monetary expansion. He analyzed the effects of a change in the liquidity ratio in a financial environment with unregulated intermediaries and where banks were free to adjust interest rates. To maintain lending to the private sector constant, an increase in the liquidity ratio might actually induce banks to raise additional funds by issuing certificates of deposits (CDs).⁶ In Hörngren's analysis, induced by an increase in the CD interest rate, the public would obtain certificates of deposit from banks in exchange for bonds, which banks needed to fulfill the higher ratio.⁷

Notwithstanding the above views, the impact of an increase in the liquid asset requirement on the money supply is unpredictable. In contrast to a cash reserve requirement, which must be fulfilled typically through holdings of cash and deposits with the central bank, a liquid asset requirement can usually be met with a range of assets.⁸ This range, however, complicates the ex ante calculation of the effects on narrow and broad monetary aggregates of a given change in the ratio which would differ depending upon the type and composition of eligible liquid assets and the interest sensitivity of banks' asset portfolio.

⁶Banks may want to maintain lending at a constant level because premature termination of loans may upset established customer relations. This argument is further strengthened when banks perceive the changes in the liquidity ratio as temporary.

⁷Hörngren admits that this perverse effect of a change in the liquidity ratio on the money supply is primarily a short-run effect because CDs are an expensive source of funds.

⁸To the extent that a liquid asset requirement specifies a strict sublimit to be kept in cash or deposits with the central bank, this share is in fact an additional cash reserve requirement and should be analyzed as such.

The overall effect is likely to fall between two extremes: the minimum effect on narrow money would be a change in a liquid asset requirement that primarily induces investment in government or private sector securities. In that case, there would not be any first-round effect on narrow or broad money aggregates. Nevertheless, a second-round effect arising from interest rate effects on currency and bank reserves could have an impact on broad money. However, as discussed above, Myhrman and Clark both claimed that these effects were small in absolute value. Conversely, the maximum effect on narrow money would be achieved when the change in a liquid asset requirement was to be exclusively satisfied through adjustments in cash holdings or deposits with the central bank—amounting, in fact, to a change in the cash reserve requirement. A similar effect on narrow money would be achieved when the requirement was satisfied with central bank liabilities, such as central bank bills, or with securities issued and negotiated abroad.⁹ In these cases, the change in the liquid asset requirement primarily influences the demand for base money and, in turn, the overall liquidity conditions in the economy. Nevertheless, from a monetary standpoint, a liquid asset requirement is generally an inefficient and redundant instrument that may introduce serious distortions.

B. As a Selective Credit Instrument

Although liquid asset requirements' effectiveness for monetary policy is inadequate, they have important allocative effects on certain sectors of the economy and have thus been used for selective credit control purposes.¹⁰ In particular, they have been used to allocate credit to the government by requiring commercial banks to hold government debt such as treasury bills, often at below-market rates.¹¹ A binding liquid asset requirement forces an increase in the demand for these securities and limits their trading.

However, in all but the most liquid markets, such forced demand for government securities will distort the structure of interest rates. Yields on government securities will be lower than they would be if banks could allocate all assets freely. Below market returns, necessarily, imply lower returns on banks' overall asset portfolio—amounting to an implicit tax on the institutions subject to the liquid asset requirement. Borrowing costs shift from the government

⁹A liquid asset requirement may also have an impact on narrow money if it forces banks to hold debt that the government would otherwise place with the central bank. In such a case, it allows the government to reduce its recourse to central bank borrowing.

¹⁰Selective credit controls essentially direct credit flows and thus have been used to assist in the allocation of real resources away from market-determined patterns (Hodgman, 1972).

¹¹For example, banks in Tunisia, had to hold long term bonds d'equipement at rates significantly below the market's. This requirement was abolished in 1994.

to the financial sector and, indirectly, to the economy at large. Owing to the implicit tax imposed by the forced investment, banks will want to increase their spreads, which will encourage disintermediation.

The exact size of these interest effects depends on the degree of distortions created by the liquid asset requirement. The degree of distortion itself is a function of the liquid asset requirement design, the size of the spread between market interest rates and the interest rate (or yield) on eligible securities, the overall market volume and menu of securities, and the degree of competition in financial markets. Clearly, a liquid asset ratio maintained on average would create fewer distortions than one maintained on a day-to-day (continuous) basis because the former allows banks to make better use of their liquid reserves. Also, the larger the spread between market interest rates and interest rates on eligible securities, the larger the implicit tax imposed on banks, and, thus, the larger the distortion. Moreover, in sophisticated and deep financial systems with a wide range of liquid assets, such as treasury bills, bank CDs, banker's acceptances, prime bills, and repurchase agreements (repos), forced investments cause fewer distortions than in developing markets with their limited range of liquid assets. This is because the demand for securities tends to be more elastic in the former than in the latter. Furthermore, a competitive financial market would be less likely than a noncompetitive one to transfer the implicit tax imposed by the forced investment, and the tax would therefore be less distortive.

Interest rate distortions like these just described are likely to lead to disintermediation from the regulated financial system, and, thus, the effectiveness of liquid asset requirements in inducing a higher demand for government securities remains dubious, at least in the long run (Hodgman, 1972). Applied to banks only, such a requirement would increase banks' holdings of government securities, but it would not necessarily increase the aggregate demand for these assets. Borrowers whose loans are ineligible to meet the liquid asset requirement might shift to other financial institutions that are exempt from the requirement. As a result, banks' relative importance in financial intermediation would diminish. Also, the other financial institutions' demand for government securities would decrease, offsetting the banks increased, albeit forced, demand for these securities. In addition to the disintermediation effect, the interest rate distortions could hinder the emergence of an efficient and responsive financial sector. The liquid asset requirement reduces investment choices for banks, which thus have a narrower scope to assess market risks and returns.

C. As a Government Debt Management Instrument

While liquid asset requirements traditionally have been used to channel credit to the government, they have also been used to develop a market for government securities, particularly in Asian countries such as India. Even where the government is willing to pay market interest rates a liquid asset requirement is attractive to the debt manager. It creates a captive market for government securities, which facilitates the placement of treasury securities. Also, at least in the short term, it is likely to lower the budgetary costs of a given deficit by lowering interest rates on government debt.

Easier debt management and lower interest outlays, however, come at a cost. In addition to the disintermediation effect and the inefficiencies that emerge with the use of liquid asset requirements, they contribute to the thinness of the secondary bond market by forcing banks to buy and hold a substantial fraction of the outstanding stock. Moreover, they divert attention from actions necessary to improve the creditworthiness and market design of the new government debt instruments—in particular, ensuring an appropriate interest rate level as well as the market's desired maturity structure.¹² Furthermore, given the monetary effects of a liquid asset requirement, maintaining it for debt-management reasons forces the central bank to subordinate monetary and interest rate management to the budgetary cycle.

D. As a Prudential Instrument

As a prudential instrument, a liquid asset requirement has limited usefulness. Traditionally, it has been used presumably to ensure that individual banks can meet their obligations as they fall due without incurring the heavy cost of trying to sell illiquid assets. However, notwithstanding its apparent simplicity and easy applicability, a liquid asset requirement may be a poor indicator of banks' liquidity and may be misleading.

Its use implies that the degree of liquidity of the various items included on the asset side of the balance sheet can be determined with certainty. However, even if a secondary market exists for government and private securities, these securities are not capital certain, i.e., the market value may vary over time. Swift changes in market confidence and conditions may reduce the value or marketability of certain assets, such as medium- and long-term securities, that would normally be regarded as highly liquid.

Even if the assets included are truly liquid, the rest of the bank's assets or liabilities are not necessarily liquid. For instance, the balance sheet of a bank in compliance with a liquid asset requirement could also entail a significant maturity mismatch between assets and liabilities such that, while the bank holds a large portion of its liabilities in short-term deposits, it holds most of its assets in long-term mortgage loans. Hence, a bank that is in full compliance with the liquid asset requirement could be in a much worse liquidity situation than another that does not meet the requirement.

In addition to the above shortcoming, a liquid asset requirement applied on a day-to-day (continuous) basis does not enable individual banks to meet their obligations as they fall due, much less to absorb unforeseen withdrawals of deposits. If the funds a bank holds to meet a liquid asset requirement are blocked, they constitute safe assets that make it easier for the bank to acquire assets from other sources, for example, through interbank borrowing.

¹²For example, India uses the liquid asset requirement to create demand for the bonds of certain state governments. Given the perceived lack of creditworthiness of the issuers, prudent financial institutions would not voluntarily hold the offered amounts at the stated interest rates and maturity.

However, they would not constitute “primary” liquid assets in the sense of immediate availability. In this regard, stating the liquid asset requirement as an average over some period provides individual banks with more flexibility to meet daily liquidity needs.

Liquid asset requirements can have some advantages as a prudential tool when commercial banks lack sophisticated tools for managing liquidity. The main additional benefit derives from their being easily monitored, especially if banking supervision capabilities are being established or are relatively weak. Likewise, a statutory liquid asset requirement can facilitate prudent behavior within the banking sector by ensuring a high degree of system liquidity.

However, to serve its prudential purpose, a liquid asset requirement needs to be carefully designed to mitigate some of its shortcomings. First, the level must be nonbinding; that is, it must be kept at the minimum level needed to manage cash flows and facilitate interbank settlements. Also, for reasons explained above, it is also preferable to apply the liquid asset requirement as an average requirement. In addition, the definition of “liquid asset” needs to be narrow. It should include assets that, in fact, can be realized in a relatively short time without significant loss of principal, such as cash, deposits with the central bank, correspondent and collection accounts, accounts receivable in good standing, and short-term government securities. Ideally, treasury bills and treasury bonds should be highly liquid assets. In this connection, a functioning secondary market or a central bank rediscount window would ensure that such assets can be mobilized quickly. Foreign assets issued and negotiated abroad may also be included, provided that the above requirements and the limit on the net foreign asset position are satisfied.

III. TRANSITIONAL ISSUES IN REFORMING LIQUID ASSET REQUIREMENTS

Given the problems and shortcomings outlined above, a country’s first-best solution will often call for significantly lowering or abolishing an existing liquid asset requirement. In countries where the ratio is lower than banks’ voluntary holdings of eligible securities, its abolition will not lead to any changes in portfolio behavior. However, in countries with a binding and high liquid asset requirement, a number of potential complications may arise if the ratio is abolished without implementing appropriate reforms. Furthermore, the transition itself needs to be carefully designed to ensure a smooth reform process.

A. Analytical Considerations

Transitional problems may arise if initial conditions in the monetary and fiscal environments as well as in the banking sector are unfavorable—namely, excess liquidity in the banking sector, high fiscal deficits and financially troubled banks, respectively. It may thus be necessary to abolish the requirement gradually so that the proper adjustments can be made in each of the areas highlighted above.

This section summarizes general guidelines for each of the areas noted, with more detailed discussion of possible cases given in Table 1. In the transition, adaptations to a liquid asset requirement might be possible, which can reduce the implied level of distortions (Table 1).¹³

For an assessment of the monetary environment, the relevant criteria will include the initial level of liquidity and the availability of alternative monetary instruments. Abolishing a liquid asset requirement is easiest when there is no excess liquidity and alternative monetary instruments are available. Even in the presence of excess liquidity, a reduction in the liquid asset requirement is possible when the demand for government securities is high. In all other cases, parallel supporting measures, such as sterilization operations, will be required. Implementing sterilization operations, in turn, might require developing alternative monetary instruments.

The overall fiscal environment—including the budget deficit and available financing instruments—is the second area of concern. If the starting deficit is low and alternative financing instruments are available, there are no fiscal impediments to a speedy abolition of the liquid asset requirement. However, reducing the fiscal deficit while removing or reforming the liquid asset requirement offsets the resulting interest rate pressures. If, in contrast, the deficit is sizable and alternative financing instruments do not exist, the case for a quick abolition of the liquid asset requirement is weakened. In this case, phased-in abolition should be coordinated with both fiscal action to lower the overall financing needs and, as required, with the development of market-based financing instruments.

Finally, before a country's monetary authorities can determine how quickly to phase out a liquid asset requirement, the state of the banking system, including the health of the banking sector and progress in modernizing banking supervision should be examined. Straightforward advice for immediate abolition can be supported only when policy makers have other prudential instruments at hand to monitor the solvency and liquidity of commercial banks. In all other cases (discussed below), the liquid asset requirement might have to stay in place temporarily while supervision based on other instruments is being strengthened. Meanwhile, however, the liquid asset requirement might be designed more efficiently, for example, by allowing for period averaging, reducing excessively high levels, and broadening the range of eligible assets to include those assets that in fact can be realized in a relatively short time without significant loss of principal.

¹³The exact size of all effects is country specific, depending, among other considerations, on the level of the ratio, the range of eligible and alternative securities available, and other monetary regulations, such as interest rate controls. For this reason, the discussion has to remain general and each case will warrant a careful examination of timing and sequencing issues.

Table 1. How to Lower or Abolish a Liquid Asset Requirement

Monetary Considerations		
Case	Starting position:	Starting position:
Alternative monetary instruments available	Abolish; use other monetary instruments to avoid possible undesired liquidity and interest rate consequences.	Assess additional liquidity and interest rate change involved. Coordinate the use of other monetary instruments with abolition. If sterilization is costly, fiscal action would be needed.
No alternative monetary instruments	Assess possible impact; abolish, unless liquidity and interest effect is expected to cause significant disruption. In the latter case, phase in abolition in tandem with development of alternative instruments.	Assess additional liquidity impact. Phase in abolition as other (fiscal and monetary) instruments become available. To increase commitment draw up plan for such instruments and timetable for introduction.
Fiscal Considerations		
Case	Starting position:	Starting position: High fiscal deficit
Alternative government debt instruments available	Abolish immediately; use market-based instruments to refinance stock of outstanding debt.	Assess additional interest rate cost. Evaluate the relative distortions from the current financing (taxation of financial sector) versus other means of financing. Phase in abolition as the fiscal deficit is reduced and as deficit financing shifts to market-based government debt instruments.
No alternative government debt instruments	Abolish; develop government securities market by converting the outstanding stock of government debt in negotiable securities at market rates.	Assess the relative costs of other financing (direct taxes, inflation). Phase in abolition as the government securities market develops and the fiscal deficit is reduced.
State of the Banking Sector		
Case	Fundamentally Sound	Financially Troubled
Other prudential instruments in place	Abolish.	Abolish. Use other instruments to ensure sound investments of the funds.
Prudential control in early phase	Phase in abolition while drawing up alternative prudential control mechanisms. In the interim improve prudential qualities of the LAR. Address bank accounting standards for valuation of security holdings.	Assess implicit tax due to LAR. Phase in abolition while developing other prudential instruments, but, if necessary, improve design and bring remuneration to market level. Address bank accounting standards for valuation of securities.

Source: Gulde (1995)

Sometimes, the rise in interest rates that may accompany the abolition of the liquid asset requirement reduces the value of the often large government securities portfolio of banks, and depending on the accounting rules for the valuation of securities, adversely affects banks' balance sheets and income statements. In addition, the realized value of a bank's government securities portfolio could be affected differently if it regularly trades the securities as opposed to maintaining them until maturity. It may be desirable to abolish the liquid asset requirement gradually while banks build up enough reserves to absorb valuation or actual losses.

B. Technical and Strategic Problems

Liberalizing interest rates while maintaining, in parallel, the liquid asset requirement poses some technical and strategic problems for monetary management. During periods of cash reserve shortages, when commercial banks hold limited liquid assets in excess of the requirement, an outright purchase of treasury bills by the central bank to relieve the cash reserve shortage could create a shortage of liquid assets (Johnston and per Brekk, 1989). Early in the reform process, the central bank could reduce the liquid asset requirement to avoid this potential complication. If this problem arises at a later stage of the reform process, lowering or phasing out the requirement could be accelerated. Alternatively, to relieve cash reserve shortages, the central bank could use repos rather than outright purchases of treasury bills while allowing those bills to continue to be counted toward meeting the liquid asset requirement. Under these circumstances, repos would not create a shortage of liquid assets. However, this may entail double-counting the cash paid by the central bank and the treasury bills purchased in a repo. In any case, repo transactions would not solve the problem of a structural shortage of discountable paper.

Introducing market-related selling techniques for government securities while maintaining the liquid asset requirement also poses some technical and strategic problems for fiscal and debt management. In particular, issuing additional securities at auction while maintaining a captive demand for securities may distort interest rate signals. Maintaining a captive demand for the eligible securities implies lower budgetary costs than those that would be incurred at truly market rates. This, in turn, may induce further government spending at a time when fiscal tightening is necessary. Another problem is that, as discussed previously, forcing banks to hold government securities may limit the growth of outright transactions and—depending on banking regulations—repos in that security. Thus, to get reliable interest rate signals and for market-development purposes, it might be preferable to make the new or additional government securities ineligible to meet the liquid asset requirement. Alternatively, lowering or phasing out the requirement could be accelerated.

C. Methods

Once a decision is made to gradually lower the liquid asset requirement, several methods to attain this outcome may be used. To reform the liquid asset requirement, the new requirement may be applied on the stock or flow (or both) of deposits as of a benchmark time, and ordinary or specially issued government securities may be used as eligible assets.

Regarding the stock or flow dilemma, several options are possible. First, the liquid asset requirement could be maintained on both the stock and the flow of deposits, but the ratio could be reduced (through applying the same ratio on both the stock and the flow of deposits).¹⁴ Second, the liquid asset requirement could be applied only on the stock of deposits as of a benchmark time. Any increase in deposits would not require additional purchases of government securities. After a reasonable adjustment period, the liquidity requirement on the stock of deposits could also be lowered. Third, the liquid asset requirement could be applied only on the flow of deposits as of a benchmark time.

These options each have a number of advantages and disadvantages. In general, maintaining the requirement on the stock of deposits, but not on the flow, would favor new banks because they would not be subject to any constraint. In contrast, maintaining the requirement on the flow of deposits, but not on the stock, would penalize banks that are actively mobilizing additional resources, thus discouraging competition among banks. Therefore, applying the liquid asset requirement across the board on both the stock and the flow of deposits gives an even treatment to new and old banks. The latter option would be particularly attractive in growing financial systems with new banks, and it has the advantage of simplicity. Although it does represent a less marked departure from the past, and thus offers the temptation of raising the coefficient whenever needed, the same effect could occur under other options.

Regarding the eligible assets, two main options are possible. If the liquid asset requirement is maintained (both on the stock and flow), banks would continue satisfying the requirement with market-based treasury bills. Alternatively, if the requirement is only maintained on the stock of deposits, the government could convert banks' statutory holdings of treasury bills into long-term securities.¹⁵ While maintaining a captive demand for securities may distort interest rate signals, issuing long-term securities may pose some operational problems. First, there is the problem of appropriately "pricing" long-term securities. Second, conversion into long-term securities may create liquidity problems for banks that suffer a deposit loss, particularly if the secondary market for government securities is not well developed. During the transition, unless banks hold government securities at below market rates, it is thus preferable to maintain the requirement and to continue satisfying the requirement with market-based treasury bills.

¹⁴A variant of this option—a more complicated one—would entail applying a different coefficient on the stock of deposits than that applied on the flow of deposits as of a benchmark time.

¹⁵As explained above, the latter has the advantage of representing a marked departure with the past. This option becomes more relevant when banks have been forced to hold government securities at below market rates.

IV. COUNTRY EXPERIENCES

Country experiences with designing and using liquid asset requirements are analyzed below. While industrial countries have for the most part eliminated them for monetary and prudential purposes, developing countries and economies in transition are still using them. Recently, liquid asset requirements have been used in the context of currency board arrangements as a prudential instrument to help banks meet their systemic liquidity needs without resorting to borrowing from the central bank. However, the general trend has been to reform this instrument with a view to improving banks' liquidity management. This reform has included lowering liquid asset ratios to the minimum level needed to manage cash flows and facilitate interbank settlements, allowing for averaging of liquid asset balances and including among the list of eligible assets those that can be realized in a relatively short time without significant loss of principal. Thus, in addition to analyzing the use and design of liquid asset requirements in selected countries, this section discusses the conditions that facilitated or hindered the process of reforming or removing the liquid asset requirement in Jamaica, Malaysia, Mexico, New Zealand, and Turkey.

A. The Use of Liquid Asset Requirements¹⁶

Supervisors in industrial countries mainly use an approach to measure liquidity that is based on a global analysis of a bank's balance sheet and relevant off-balance-sheet items that can give a much more accurate picture of a bank's liquidity.¹⁷ This approach places greater emphasis on the maturity structure of a bank's assets and liabilities and is based on a cash-flow concept.¹⁸ Currently, industrial countries do not use a minimum liquid asset requirement for monetary or debt-management purposes, and only Austria and Iceland use it mainly for prudential purposes.¹⁹ In some countries, such as Ireland and the Netherlands, supervisors enjoy a certain discretion to modulate liquidity requirements according to circumstances and

¹⁶Appendix I includes information on the use of LARs in selected industrial, developing and transition economies. Countries have been classified following the World Economic Outlook country classification system.

¹⁷The Appendix includes information on the use of liquid asset requirements in selected industrial, developing and transition economies. Countries have been classified following the World Economic Outlook country classification system.

¹⁸The Basle Committee has issued a set of nonbinding guidelines to measure and manage liquidity. These guidelines rely on a maturity ladder and the calculation of a cumulating excess or deficit of funds (Basle Committee on Banking Supervision, 1992).

¹⁹However, most industrial countries still use reserve requirements for monetary management. For an analysis of the use of reserve requirements in industrial and other countries, see Chapter 2.

the risks experienced by individual banks. However, other industrial countries (Canada, Italy, New Zealand, Spain, and United States) do not use liquid asset requirements at all for prudential purposes.²⁰

The use of liquid asset requirements in developing countries mainly reflects a mix of monetary and prudential purposes. In the transition from direct to indirect instruments of monetary control, developing countries have taken different measures in connection with liquid asset requirements. Some countries continue using them as a monetary instrument by including central bank liabilities among the eligible assets. For instance, Bangladesh, Botswana, Ghana, Jamaica, Malaysia, and Mauritius allow banks to satisfy the liquid asset requirement with central bank bills. Still other countries use this requirement mostly for prudential purposes (Kenya and Taiwan Province of China). Other countries have gradually abolished or are abolishing liquid asset requirements as a selective credit or debt-management instrument (India, Mexico, Tunisia). Few sample countries (Burundi, Ghana) use it for selective credit purposes.

More recently, liquid asset requirements have been used for prudential purposes in the context of currency boards (Baliño and Enoch, 1997). In 1995, the Central Bank of Argentina, which has a currency board arrangement, effectively replaced an unremunerated reserve requirement system with a liquid asset requirement, both maintained on average. This new requirement reduces the implicit tax burden imposed on commercial banks and safeguards bank liquidity against capital flight. It applies to all non-interbank liabilities and can be satisfied by holdings of interest-earning Bank Liquidity Certificates issued by the treasury, a special account at an international bank abroad, the central bank's reverse repurchase agreements, government bonds of OECD countries with ratings of a single A or better, and Argentine securities.²¹ If banks are allowed to fulfill the liquidity requirements with foreign assets, the need for backing banks' reserves at the monetary authority declines. Furthermore, a reduction in the liquid asset requirement would allow the banking system to obtain foreign assets to meet deposit

²⁰For a discussion of prudential supervision of liquidity management in the member countries of the Organization for Economic Co-operation and Development (OECD), see Pecchioli (1987) and Gulde (1995).

²¹The proceeds from the Bank Liquidity Certificates must be placed in the international reserves of the central bank. The special account abroad must be held at the Deutsche Bank in New York. The requirements can be fulfilled up to 100 percent by the Central Bank of Argentina's reverse repo or the Liquidity Certificates, up to 60 percent by deposits with the Deutsche Bank, and up to 10 percent by Argentine securities.

withdrawals, thus serving as a substitute, albeit an imperfect one, for the lender-of-last-resort function that the Central Bank of Argentina cannot perform owing to the currency board arrangement.²²

Some countries with significant foreign currency deposits such as Croatia and Honduras have used liquidity requirements on foreign currency deposits to limit foreign currency credit growth, while imposing unremunerated reserve requirements on domestic currency deposits. Given that in these countries liquidity requirements on foreign currency deposits are mainly satisfied with foreign currency liquid assets remunerated at market rates such as deposits abroad, that policy encourages foreign currency deposit growth by unduly taxing domestic currency deposits.²³

Many economies in transition, in particular the Baltic countries, Russia, and the other countries of the former Soviet Union, have a number of liquidity ratios in place for prudential purposes. However, liquidity cannot be easily managed owing to the limited availability of liquid assets and the embryonic nature of secondary markets for securities. Even in countries where there is a growing secondary market for government securities, such as Russia, liquid assets cannot be mobilized as rapidly as in other countries because of the inadequacies of the payments system. Nevertheless, these ratios may be needed for some time, until the approach to liquidity supervision becomes more sophisticated. In this regard, supervisors need to develop an understanding of the issues in asset and liability management, and commercial banks need to implement liquidity indicators and cash-flow analysis systems and report on them within a specific time frame.

B. The Design of Liquid Asset Requirements

In general, countries have defined the liquid asset requirement in various forms depending on the eligible securities banks are required to hold, the base to which the liquid asset requirement applies, and the methodology of calculation.

The eligible range of assets varies, but usually includes cash, deposits with the central bank, government securities, and net short-term positions in the money market. In a few countries, such as Botswana, private sector securities are also included, but the credit risk of holding these securities is typically higher than that of holding government securities. Only in Argentina were reverse repos included as an eligible asset; this allows the Central Bank of

²²Changes in the requirement may be used to provide liquidity to the banking system, but liquidity is provided only in proportion to deposits. Given that liquidity demands in smaller banks might be more than proportional to deposits, in the absence of interbank loans, a lender-of-last-resort facility might still be necessary (Machinea, 1996).

²³For a discussion of reserve requirements on foreign currency deposits see Ize (1995).

Argentina to manage intramonth fluctuations in liquidity.²⁴ In a few countries, such as Jamaica and Malawi, eligible assets include only government and central bank securities; however, in addition, a cash reserve requirement is imposed on commercial banks.

The base usually consists of deposit liabilities, but in a few countries it includes nondeposit liabilities, such as asset-backed securities and repos (Turkey), and thus the latter bank liabilities are viewed as close deposit substitutes. Regarding interbank borrowing, in Malaysia, liquid asset requirements apply to net interbank borrowing of individual banks, thus eliminating the effect of double taxation present when interbank borrowing is included.

Countries that have made some progress in financial sector reform, and that maintain a liquid asset requirement, usually calculate it on average to improve banks' liquidity management (Argentina, China, Malaysia, and Mauritius). This measure lowers the operating costs of financial institutions, and dampens the volatility in interbank market interest rates caused by banks' seeking to meet their day-to-day requirements.

Several countries have a liquid asset requirement for foreign currency deposits (Argentina, Croatia, Honduras, Kenya, Malaysia, Mexico, and Turkey). Whereas in Argentina, Croatia, Honduras and Mexico banks are allowed to fulfill these requirements with foreign assets,²⁵ in Kenya, Malaysia and Turkey, banks must fulfill the requirement with domestic currency assets, mostly with government and central bank securities. Holding liquidity requirements on foreign currency deposits in foreign currency may limit foreign currency liquidity risk, particularly in countries with a significant amount of foreign currency deposits such as Argentina.

C. Lessons From Experience in Reform

This section analyzes the actual experience of selected countries in removing or reforming liquid asset requirements in light of the discussion in the previous section. The sample contains both industrial and nonindustrial countries, selected to include both successful and unsuccessful experiences. It comprises Jamaica, Malaysia, Mexico, New Zealand, and

²⁴Including reverse repos does not entail double-counting because bank reserves at the Central Bank of Argentina are not an eligible asset.

²⁵In Argentina, banks are allowed to hold high-quality foreign assets to meet liquidity requirements on domestic currency deposits. This measure was implemented to enhance the credibility of the fixed exchange rate regime. In Croatia, Honduras and Mexico, eligible foreign assets used to satisfy requirements on foreign currency deposits include foreign deposits abroad.

Turkey.²⁶ To better illustrate the complexities of this reform, the subsequent analysis focuses on (1) institutional and macroeconomic conditions, (2) the pace of reform, (3) supporting reforms, and (4) implementation experience.

Institutional and macroeconomic conditions

Although the reform experience of the sample countries has been diverse, certain initial conditions were common to most of them. In all countries, central banks relied on a monetary framework with direct controls, including interest rate restrictions, domestic credit controls, and high cash and liquidity requirements. The use of these controls diverted financial flows to unregulated markets or institutions (see Appendix II). Moreover, the government securities market was largely captive in that the government relied on statutory investment requirements to fund part of its budgetary operations. Outright transactions in government securities were virtually nonexistent because these securities were generally held until maturity to meet the day-to-day continuous requirements. Similarly, repurchase agreements in government securities were also discouraged because banking regulations usually required eligible assets to be unencumbered. Further common features were a low level of central bank autonomy, weak and segmented money and interbank markets, and ineffective banking supervision.

All sample countries had large macroeconomic imbalances at the start of the reform, as measured by high fiscal deficits in relation to GDP (Table 2). In addition, Jamaica, Mexico, and Turkey had inflation rates of more than 20 percent; but only Jamaica had negative real interest rates. Jamaica, New Zealand, and Turkey were coping with excess liquidity in the financial system at the time of the reform. As a consequence, for the sample countries, reforming the liquid asset requirement was part of a more comprehensive reform and stabilization program. Undoubtedly, the success of the reforms and that of the stabilization program were closely linked.

In most cases, macroeconomic conditions improved after the reforms. All of the sample countries adopted a macroeconomic stabilization program, with Jamaica, Mexico, and Turkey having an IMF-supported program at the outset of the reform. In all sample countries except Jamaica, the fiscal deficit was consistently reduced; in Jamaica, the consolidated public sector fiscal deficit returned to prereform levels in less than three years owing to the impact of a severe hurricane on public sector expenditures and on the operating surplus of enterprises involved in rehabilitation programs after the hurricane (Table 2). The Bank of Jamaica issued its own certificates to mop up the excess liquidity caused by the fiscal imbalance, but this tactic was insufficient to control credit growth because implicit interest rate caps were placed on auctioned securities. In Turkey, the fiscal deficit was reduced, but excessively high domestic borrowing requirements remained, which the authorities were at times reluctant to finance at market rates of interest.

²⁶The experiences of these countries in reforming LARs are described in detail in Appendix II.

Table 2. Macroeconomic Conditions During the Reform of Liquidity Requirements

	Jamaica	Malaysia	Mexico	New Zealand	Turkey
Inflation 1/	23.1 (1985) 10.7 (1986) 8.4 (1987-1988) 17.2 (1989)	0.3 (1985) 0.7 (1986) 0.3 (1987) 2.5 (1988)	51.7 (1988) 19.7 (1989) 29.9 (1990) 18.8 (1991)	8.7 (1984) 15.2 (1985) 14.7 (1986) 13.3 (1987)	71.1 (1993) 125.5 (1994) 78.9 (1995)
Real interest rates 2/	< 0 (1982-85) > 5 (1986-88)	> 3 (1985-86) > 2 (1987) < 1 (1988)	< 9 (1988) > 20 (1989) < 3 (1990) > 0 (1991)	> 5 (1985) < 0 (1986-87) > 4 (1988)	> 8 (1993) > 9 (1994) > 50 (1995)
Fiscal balance 3/	-13.2 (1985/86) -5.6 (1986/87) -5.4 (1987/88) -13.4 (1988/89)	-6.1 (1985) -11.2 (1986) -8.2 (1987) -3.8 (1988)	-11.6 (1988) -5.2 (1989) -3.6 (1990) 0.4 (1991)	-8.2 (1984) -4.5 (1985) -3.6 (1986)	-12.5 (1993) -8.0 (1994) -6.6 (1995)
Monetary conditions 4/	Recurrent periods of rapid credit demand growth followed by monetary tightening to alleviate pressures on prices and the balance of payments.	Tight until 1987 owing to substantial reduction in the terms of trade; from 1991, significant capital inflows.	Tight until 1989; from 1990-93 conditions eased owing to capital inflows.	Unstable monetary conditions owing to volatile capital flows; more stable monetary conditions after 1985, when the authorities decided to float the currency.	Recurrent periods of rapid reserve money growth followed by monetary tightening to alleviate pressures on prices and the balance of payments.

Source: International Monetary Fund, International Financial Statistics and various Recent Economic Developments.

1/ Measured using consumer price index; end of period for Jamaica, Mexico and Turkey; average, otherwise.

2/ Measured ex-post using deposit rates for Jamaica, three-month treasury bill rate for Malaysia and Turkey, 28-day treasury certificate rate for Mexico, and five-year government bond yield for New Zealand. Choice of interest rate based on data availability. Consumer price index used as deflator.

3/ As a percentage of GDP. For Jamaica, includes central bank losses.

4/ Measured using excess reserves of commercial banks, that is, those reserves above the banks' demand for statutory and precautionary reasons.

After macroeconomic stabilization was implemented, in all sample countries except Turkey, inflation was lowered and remained below 20 percent after the reforms. Real interest rates were negative in Mexico and New Zealand for a short time, possibly owing to capital inflows. In contrast, Turkey had very high real interest rates perhaps owing to banking distress in commercial banks (see below) and political instability. In Malaysia, during 1985-86, tight liquidity conditions, caused by a decline in the terms of trade, did not translate into high real interest rates owing to interest rate controls.²⁷

After the stabilization program and reforms were introduced, in most cases, domestic liquidity was significantly affected by capital flows. In New Zealand, the decision to float the currency in March 1985 facilitated monetary control. During 1991-94, Malaysia experienced a surge in capital inflows that—coupled with the decision to maintain export competitiveness and threatened with a loss of monetary control—prompted the central bank to impose a number of administrative and monetary measures to manage these flows.²⁸ During 1994-95, Turkey also experienced short-term volatile capital flows in the context of a high domestic public sector borrowing requirement (see Appendix II).

Pace and approaches to reform

The pace of reform has varied across the sample countries. While New Zealand eliminated its liquid asset requirement overnight, the rest either took a more gradual approach, or the process was not smooth.²⁹ Jamaica took three years to phase out the liquidity ratio, but reintroduced it in less than one year owing to unstable macroeconomic conditions and inconsistencies in implementing indirect monetary control.³⁰ Turkey maintained a high requirement on the stock of deposits as of April 1994, but, in less than one year, reintroduced it on the flow of deposit and nondeposit liabilities—albeit at a low level—owing to unstable macroeconomic and financial conditions. Malaysia took five years to reform its liquid asset requirement in a

²⁷At that time, banks were required to peg all their lending rates to a base lending rate that was under the administrative control of the central bank.

²⁸During 1991-94, a number of monetary instruments were used to sterilize the inflows, including increases in reserve requirements, transfers of public sector deposits, borrowing in the interbank market, and placement of Bank Negara Malaysia bills. In addition, the liability base of commercial banks used to calculate reserve and liquidity requirements was redefined to include all inflows of funds from abroad.

²⁹Tables 3 and 4 summarize the key features of the reform.

³⁰From 1989 to end-1992, except for a brief period, the Bank of Jamaica steadily increased the liquid asset requirement and unremunerated reserve requirements. It maintained these requirements at 50 percent and 25 percent, respectively, until mid-1995, when it lowered the liquid asset requirement to 47 percent while maintaining unremunerated reserve requirements.

Table 3. Country Experiences During the Reform of Liquidity Requirements

	Jamaica	Malaysia	Mexico	New Zealand	Turkey
Pace and Timing of Reforms	Gradual removal 1985-88; reintroduced 1989	LAR reduced 1985, averaging introduced (asset holdings, 1987; base, 1990), Bank Negara Malaysia bills become an eligible asset 1993	Gradual removal planned 1989-99, but it was accelerated 1989-92	Speedy removal 1985	Gradual removal planned 1994-?, reintroduced at low level (1995)
Supporting Measures and Reforms					
Fiscal policy	High fiscal and quasi-fiscal deficit	Until 1987, high borrowing requirements	Sustained decrease in borrowing requirements	Sustained decrease in borrowing requirements	Sustained decrease in borrowing requirements
Monetary policy	Loss of monetary control 1989	Tight stance; in 1994, regulatory measures implemented to control capital inflows	Tight stance	Tight stance; problems of monetary control after reforms	Tight stance was not consistently sustained
Monetary instruments	Market-determined time deposits and lending rates 1985; auctions of central bank CDS (from 1985)	Interest rates deregulated 1989-91; combined use of direct and indirect instruments (from 1989)	Removal of interest rate ceilings 1989; early 1990s, main instrument is open market operations	Removal of interest rate controls 1984; since 1984, use of indirect methods of monetary control	Interest rate controls removed in mid-1980s; open market operations introduced 1987
Government debt instruments	Treasury bills have been auctioned since the 1960s	Since 1987, market-related rates; since 1989, based on auction rates	Primary and secondary market for government securities gradually developed in the 1980s	Market-based government debt strategy introduced (1984)	Erratic development of market-based government debt strategy; auction of government securities introduced May 1985
Health of banking system	Strong commercial banks, weak nonbanks; one nonbank closed 1987	Banks suffered large losses owing to a decline in the terms of trade; four banks were restructured 1985-86	Banks privatized 1990-92; nonperforming loans increased after reforms	Sound commercial banks; community-owned banks were reformed to remove restrictions on their operations	Banks suffered losses owing to surging interest rates and exchange rate depreciation; three banks closed 1994
Prudential supervision	Banking supervision was strengthened only in the 1990s	Strengthened during 1989-93; banks' exposure to the real estate and stock markets is regularly monitored	In 1991, loan loss provisioning was strengthened, capital adequacy ratio introduced	Strengthened as part of the financial sector reform process 1986, 1989	Strengthened gradually in 1988-92; tighter prudential measures implemented in 1994 and 1995
Implementation experience	Adverse macroeconomic conditions; inconsistent monetary policy	Limited development of government securities markets	Under reserve shortages, liquid asset requirement may complicate monetary management	After the reforms, secondary markets for government securities developed quickly	Unstable macroeconomic and financial conditions; inconsistent policy mix

Table 4. Approaches to Reform

	I	II	III
	Reduced liquidity coefficient	Same or reduced stock coefficient (calculated on deposits as of certain date); no requirement on the flow	Same or reduced stock coefficient; reduced coefficient on the flow
Available government securities	Mexico (1989) Malaysia (1985) Jamaica (1985-88)		
Special government security		Mexico (1991) Turkey (1994)	Turkey (1995)

piecemeal fashion, with a view to using it for prudential purposes; however, in recent years, there was a renewed interest in the using the liquid asset requirement for monetary purposes owing to massive capital inflows. In contrast, Mexico, which initially maintained a much reduced requirement on the stock and flow of deposits in relation to prereform levels, accelerated the reform owing to a structural shortage of government securities. In 1991, the Bank of Mexico reduced the requirement, maintaining it only on the stock of deposits as of August 1991, and in 1992 eliminated it altogether to increase the supply of loanable funds and foster a reduction in intermediation margins. Today, Jamaica, Malaysia and Turkey continue to employ liquid asset requirements.

Regarding the eligible securities, only Mexico (in 1991) and Turkey chose to issue a special long-term government security to satisfy the liquid asset requirement. Because, in both cases, the requirement was calculated on the stock of deposits (as of a specified date), domestic government debt financed by banks could be maintained at a certain level, while the necessary adjustments were made in government expenditures and revenues.

Supporting measures and reforms

In all sample countries, the reform of the liquid asset requirement was part of a broader financial reform package that included adapting monetary operations to foster both market development and monetary control, implementing or further developing a market-based

government debt strategy, and improving banking supervision and prudential regulation. In addition, in Malaysia and Turkey, some banks were closed or restructured owing to their significant financial problems (see below).

Central banks in the sample countries introduced indirect methods of monetary control, each at a different pace and intensity. All countries that planned to remove the liquid asset requirement liberalized interest rates early in the reform to provide adequate scope for market-based instruments. Indeed, Jamaica, Mexico, New Zealand, and Turkey had already liberalized interest rates by the time they removed the liquid asset requirement.

In some countries, such as New Zealand, success in implementing an indirect framework of monetary control, including indirect instruments, encouraged the permanent removal of the liquid asset requirement. In Mexico, outright transactions in the secondary market for treasury certificates (CETES) and repurchase and reverse repurchase operations in the same security became the main instrument in early 1990, shortly after the beginning of financial reforms and even before the liquid asset requirement was eliminated. However, in Malaysia, a thin government securities market limited the scope for open market operations in this market and Bank Negara Malaysia chose to maintain a complementary mix of direct and indirect monetary instruments. In the early 1990s, it was using indirect instruments, such as borrowing in the interbank market, but maintained liquidity requirements. In Jamaica, in the context of a fixed exchange rate and high fiscal imbalances, inconsistencies in implementing an indirect framework of monetary control led to the reintroduction of the liquid asset requirement.

Countries that successfully removed the liquid asset requirement, such as Mexico and New Zealand, also succeeded in implementing a market-based government debt strategy. To facilitate secondary market trading, the government in these countries competitively priced its own securities through auctions.

In some cases, banking reforms also had to be undertaken. Malaysia and Turkey restructured or closed a number of commercial banks that had accumulated large nonperforming loan portfolios. However, in these countries, banking problems had different effects on the pace of reform. While in Malaysia banking problems together with macroeconomic imbalances slowed down the pace, in Turkey they actually encouraged the reform. In the latter country, some of the banks' financial difficulties arose because they were required to hold government securities with a longer average maturity than that of their deposits. As a result of this forced interest rate risk exposure, banks suffered large losses when interest rates surged in early 1994. Because this was contributing to the financial difficulties of commercial banks, the central bank eliminated the liquid asset requirement on the flow of deposits as of April 1994.

In general, in most countries, banking supervision and regulation were strengthened to contain excessive risk taking on the part of banks and limit systemic problems. In addition, other means of supervising banks' liquidity beyond static ratios were developed, particularly in New Zealand. Although reforms in banking supervision were implemented with some delay,

reversals in reforms cannot be attributed to banking supervision shortcomings. As discussed below, other factors, such as macroeconomic instability, may have been more important in inducing reversals. Nevertheless, in some cases, rapid credit growth coupled with limited banking supervision increased commercial banks' nonperforming loans. For instance, in Mexico, the percentage of nonperforming loans net of provisions in relation to equity increased after the implementation of financial reforms including bank privatization and the abolition of the liquid asset requirement.³¹

Implementation experience

While New Zealand had a fairly speedy and smooth reform, other countries have faced a wide variety of problems during the process of reforming the liquid asset requirement, mainly because certain institutional and economic conditions were often lacking. Several factors contributed to a smooth implementation of reforms in New Zealand: the curtailment of the government's direct access to central bank financing; a monetary policy firmly oriented toward price stability; the use of indirect instruments of monetary control; the development of a market-based government debt strategy; and new prudential measures and a strengthening of banking supervision. Undoubtedly, sound commercial banking was also an important factor, because banks were able to absorb some government securities valuation losses induced in part by the abolition of the liquid asset requirement.

Jamaica, Malaysia, and Turkey experienced reversals of reforms. In Jamaica and Turkey, the reversal was a direct response to excessively high fiscal and quasi-fiscal imbalances, which at times the authorities were reluctant to finance at market rates of interest. While Jamaica reintroduced the liquid asset requirement at prereform levels, Turkey reintroduced it at a low level. In Malaysia, the renewed interest in the liquid asset requirement for monetary purposes was prompted by monetary instability caused by capital inflows. Thus, unstable macroeconomic and financial conditions and monetary instability were key factors in policy reversals. In contrast, Mexico accelerated the reform after experiencing difficulties, under tight money market conditions, in implementing monetary operations through outright purchases of treasury bills while maintaining the liquid asset requirement—a potential complication discussed earlier. To lower short-term interest rates, the Bank of Mexico injected bank reserves by purchasing large amounts of CETES at the primary auction, an operation that aggravated the shortage of assets eligible to satisfy the liquid asset requirement. As a result, commercial banks had difficulty in complying with the requirement except by holding cash.

³¹In Mexico, managerial capacity was weak in newly privatized banks, which had limited experience in adequately assessing credit and other market risks. Also, financial liberalization and the strengthening of the public finances—which reduced the public sector's recourse to bank credit—resulted in a shift of lending in favor of higher credit risk borrowers.

A positive externality of the financial sector reform, including the reform in liquid asset requirements, was the growth of the interbank market and of the government securities secondary markets. Once interest rates were liberalized and the government followed a market-based government debt strategy, these markets developed quickly. This was particularly so in Mexico and New Zealand, but less so in Jamaica, Malaysia, and Turkey. In Jamaica, the development of the securities market over the period of reform was constrained by the active participation of the central bank. In Malaysia, although interbank market transactions grew in volume, the growth of the government securities market remained limited because the supply of government securities was not able to match the growing demand. In Turkey, the interbank market and the secondary market for government securities have been growing, albeit erratically.

Another positive effect of the financial sector reform, including the reform of the liquid asset requirement, was that resources shifted from nonbanks back to commercial banks and from deposit-like liabilities to deposit liabilities. In addition, the reform of the liquid asset requirement increased the efficiency of financial intermediaries by reducing distortions in the structure of interest rates. Although these developments cannot be exclusively attributed to the reform of the liquid asset requirement, developments in this area certainly played a role.

In sum, experience in the sample countries suggests that the reform of the liquid asset requirement, particularly in countries where it is an important instrument, is most effective and most smoothly accomplished in conditions of a stable macroeconomic environment with sound fiscal policies. In addition, implementing a market-based government debt strategy, encouraging the development of a sound financial system, and strengthening the supervisory framework helps to sustain the reform. More generally, the experiences of those countries also suggest that the removal of the liquid asset requirement is usually part of a process of financial sector reform and cannot be segregated from a successful transition from direct to indirect monetary control.

V. CONCLUSIONS

Liquid asset requirements have shortcomings as either a monetary, a debt management or a prudential instrument. As a monetary instrument, the impact of a change in the liquid asset requirement on the money supply is unpredictable because it depends on which assets banks choose to satisfy the requirement. If banks satisfy an increase in the liquid asset requirement by holding government or private sector securities, then there will be no first-round effect on base money and broad monetary aggregates. A second-round effect arising from interest rate effects on the demand for currency and bank reserves could have an impact on broad money, but it is to be small in absolute value. If banks satisfy the liquid asset requirement by holding central bank securities or securities issued and negotiated abroad, then the maximum effect on narrow money and broad monetary aggregates would be achieved. Nevertheless, from a monetary standpoint, the liquid asset requirement is generally an inefficient and redundant monetary instrument that may seriously impede the efficiency of the financial sector. It may

introduce serious interest rate distortions that are likely to induce disintermediation from the regulated financial system. Therefore, its effectiveness in inducing a higher demand for central bank securities remains dubious, at least in the long run.

As a selective credit instrument, liquid asset requirements have been used to allocate credit to the government often at below market rates. This introduces serious interest rate distortions that are likely to induce disintermediation from the regulated financial system. As a debt management instrument, a liquid asset requirement will give a distorted view on the real borrowing cost of the government and may actually impede outright transactions of Government securities. Therefore, from a monetary, selective credit and debt management standpoint, liquid asset requirements should be replaced by more market-based instruments.

As a prudential instrument, sophisticated banking systems—characterized by, among other features, greater reliance on foreign and domestic interbank markets—require more elaborate liquidity standards than static ratios. However, liquid asset requirements may play a limited role as a prudential instrument in less developed banking systems or as indicators to be flexibly used in conjunction with other measures of liquidity. Moreover, liquid asset requirements can be useful when the monetary authority has limited lender-of-last-resort capabilities—such as in a currency board arrangement—to make the banking system more resilient as well as to reduce the burden imposed on commercial banks by unremunerated reserve requirements. In all these cases, the liquid asset requirement needs to be adequately designed to minimize distortions on the financial system. In this regard, it is preferable to set it at the minimum needed to manage cash flows and facilitate interbank settlements, to maintain the required liquid asset balances on an average basis, and to include among the eligible liquid assets a variety of assets that, in fact, can be realized in a relatively short time without significant loss of principal.

Abolishing or reforming the liquid asset requirement, particularly when they are an important instrument, is most smoothly accomplished under a stable macroeconomic environment, sound fiscal policies, and, if necessary, a broad financial sector reform package. Reducing the fiscal deficit while removing or reforming the liquid asset requirement helps offset the resulting interest rate pressures. Key supporting reforms are needed to minimize a wide variety of problems and ensure as smooth a reform as possible. These reforms include the following elements:

- Introducing or further developing indirect methods of monetary control in order to have more efficient means to implement monetary policy. Also, liberalizing interest rates early in the reform process provides adequate scope for market-based instruments.
- The removal of the liquid asset requirement must usually be supported by a comprehensive program to develop a market-based government debt strategy. The government must accept market rates of interest on its debt and refrain from pressuring the central bank to keep those rates low.

- A sound banking system facilitates the reform because banks are in a position to absorb the possible valuation or actual losses of their government securities portfolio that arise from the increase in interest rates that may accompany the abolition of the liquid asset requirement. However, for a variety of reasons, banks may be in a weak position to absorb the losses and need to be restructured to deal with nonperforming assets and other capital losses. More generally, given the new market-based environment, banks need to strengthen their managerial capacity because they may have little experience in adequately assessing credit and other market risks.

- The supervisory and regulatory framework needs to be reinforced—by introducing standards for minimum capital and for provisioning for doubtful loans—to encourage prudent behavior. Adequate prudential accounting standards are also needed to have a true and fair valuation of assets and liabilities; this, in turn, facilitates the market in playing a role in ensuring financial discipline. The institution involved in supervising banks needs to build the capacity to monitor banks' liquidity beyond the use of static liquidity ratios.

In addition, abolishing or reforming the liquid asset requirement is easier and less likely to suffer reversals if the authorities can do it gradually, in line with the speed with which they can introduce supporting measures. Sometimes, though, a rapid removal or reform is necessary, for instance, when the liquid asset requirement creates significant distortions in the banking system and is contributing to banks' financial difficulties. At other times, the reform may be accelerated if there are structural shortages of liquid assets or if there are conflicts with newly introduced monetary instruments.

Moreover, abolishing or reforming the liquid asset requirement within a broader financial sector reform package had significant effects on the financial system, at least judging by the experience of the sample countries. In particular, the shift of resources to unregulated financial intermediaries and markets, typically observed before the financial sector reform, reversed itself. Moreover, the reform of the liquid asset requirement reduced distortions in the structure of interest rates and, in some cases, lowered the losses of commercial banks. More generally, the reforms supported the growth of the interbank market and of the government securities market. Although these developments cannot be attributed exclusively to the reform of the liquid asset requirement, the latter certainly contributed.

Use of Liquid Asset Ratios (LARs) in Selected Countries

Country	Purpose	Comment	Features		
			Level 1/ (year)	Eligible Assets	Base
Industrial Countries					
Austria	Prudential purposes.	In addition to the liquidity requirement, banks are required to hold a reserve requirement.	7.5 percent (July 1995).	Deposits at the central bank, federal treasury certificates.	Deposit liabilities of commercial banks.
Canada	N.A.	Secondary reserve ratio introduced in 1967; reformed in 1973, to be used only for prudential purposes; currently, LAR is not used; liquidity is monitored in regular bank supervision examinations.	N.A.	N.A.	N.A.
France	N.A.	Abolished in 1967. Before 1967, the LAR was mainly used as a means of government budget financing. Currently, the Bank of France issues guidelines recommending specific liquidity ratios on foreign currency operations.	30 percent (1967).	Treasury bills, medium-term rediscountable credit.	Short-term liabilities of commercial banks.
Iceland	Prudential purposes.	LAR introduced in February 1987; maintained on a day-to-day basis (continuous) basis. Used actively for monetary control purposes until 1993.	12 percent (1996).	Cash; net claims on the central bank; treasury bills; 60 percent of a bank's holding of government bonds, government notes, and housing bonds; net claims in the interbank market.	Disposable capital funds (mainly deposits).
Ireland	Prudential purposes.	The central bank informally monitors the LAR. In addition to guidelines on liquidity requirements, the central bank has a maturity mismatch approach to examine liquidity of commercial banks.	25 percent (1995).	Notes and coins, interbank deposits, lending to the central bank (excluding deposits maintained in the Deposit Protection Account), and government securities.	Total borrowings.
Netherlands	Prudential purposes.	Flexibly applied liquid asset ratios.	N.A.	N.A.	N.A.
New Zealand	N.A.	LAR abolished in February 1985.	N.A.	N.A.	N.A.
Norway	N.A.	The LAR was eliminated in June 1987. Before 1987, it was used for monetary control.	15 percent (1987).	Cash in vault, deposits with the central bank, postal giro accounts, treasury bill holdings	Deposit liabilities.
Sweden	N.A.	LAR abolished in the fall of 1983. Before that date, it was used for monetary control and as captive market for government securities.	N.A.	N.A.	N.A.

Country	Purpose	Comment	Features		
			Level 1/ (Year)	Eligible Assets	Base
Developing Countries					
Africa					
Botswana	Prudential and monetary purposes.	Since February 1994, applied uniformly. Maintained on a day-to-day basis. Although the Bank of Botswana (BOB) has introduced indirect methods of monetary control, the LAR is still used for monetary purposes.	10 percent for commercial banks; 6 percent for credit institutions (1996).	Cash, balances held with domestic banks (including BOB), balances held abroad (excludes balances due from foreign and domestic banks), bills purchased and discounted, BOB certificates.	Total deposit liabilities.
Burundi	Prudential purposes and monetary control (until 1991).	LAR needed while banking supervision is strengthened. Maintained on a day-to-day basis.	15 percent (1993).	Balances with the central bank and commercial banks; call money on-lent; treasury certificates and bonds; savings and investment bonds; selected credits.	Sight deposits (in any currency, and including those of foreign and domestic banks); deposits of at most one-month maturity; 15 percent of other deposits; call money borrowed; provisions for documented credits; and selected liabilities and charges due within one year.
Ghana	Prudential and monetary purposes.	N.A.	52 percent; in addition, a 5 percent cash reserve ratio (CRR) (1994).	Treasury bills; government securities; Bank of Ghana bills; cocoa, grain and cotton bills; and export finance bills.	Deposit liabilities in domestic currency.
Kenya	Prudential purposes.	Maintained on a day-to-day (continuous) basis. The LAR is applied on commercial banks and nonbank financial institutions.	25 percent, including 18 percent CRR (1996).	Cash in vault, balance at the central bank, net balances at other domestic banks and at foreign banks, treasury bills with a maximum maturity of 91 days.	Deposit liabilities, including foreign currency deposits, less balances due to banks and the central bank.

Country	Purpose	Comment	Features		
			Level 1/ (Year)	Eligible Assets	Base
Malawi	Debt-management purposes.	N.A.	15 percent (1994).	Government bonds, treasury bills.	Deposit liabilities.
Mauritius	Monetary purposes.	Calculation is based on the average deposits of the previous week, it has to be maintained in the following week on an average basis.	20 percent (1996), in addition, an 8 percent CRR.	Treasury bills, Bank of Mauritius bills, and long-term government securities maturing within seven years.	Total nonbank deposits net of the retained foreign currency accounts.
Tunisia	Selective credit.	This ratio was gradually abolished owing to its distortionary effects. In the absence of developed secondary markets government bonds were not liquid and treasury bills could only be transacted between a subscribing bank and its own clients. In 1990, banks were only required to purchase (not to hold) government bonds. In 1994, this requirement was eliminated.	25 percent (1988).	Treasury bills, government bonds, bonds issued by the Caisse nationale d'epargne et de logement (CNEL). 2/	Deposit liabilities.
Zambia	Monetary and prudential purposes.	N.A.	43.5 percent (1997).	Cash, deposits in the Bank of Zambia, treasury bills.	Liabilities to the public.
Asia					
Bangladesh	Monetary and prudential purposes.	Liquid assets maintained on a day-to-day (continuous) basis.	20 percent, including a 5 percent CRR (1996).	Cash, treasury bills, Bank of Bangladesh bills.	Deposit liabilities, including interbank deposits.
China	Prudential.	For those commercial banks not subject to direct credit quotas, the People's Bank of China provides guidelines on liquidity requirements. A number of indicators such as the ratio of liquid assets to liquid liabilities and the ratio of medium- and long-term loans to medium- and long-term deposits are recommended. All ratios are calculated on the basis of 10-day averages.	N.A.	N.A.	N.A.

Country	Purpose	Comment	Features		
			Level 1/ (Year)	Eligible Assets	Base
India	Debt-management purposes.	Statutory liquid requirement gradually being reduced.	30 percent (average for 1994-95).	Excess reserves, government securities.	Deposit and time liabilities, includes net interbank borrowing if positive.
Malaysia	Mixed; monetary purposes, debt-management purposes, prudential purposes.	LAR still in use; liquid assets maintained on average.	17 percent (1995).	Cash, clearing account balances with Bank Negara Malaysia, money at call with discount houses, treasury bills, Malaysian government securities, Bank Negara Malaysia bills, Cagamas bonds, and other approved securities, such as Malaysian government Investment Certificates (Islamic issues). 3/	Domestic and foreign currency deposit and nondeposit (e.g., repurchases) liabilities of commercial banks, including net interbank transactions.
Pakistan	Mixed; monetary purposes, debt-management purposes, prudential purposes.	N.A.	30 percent (1995).	Cash in vault, deposits at the State Bank of Pakistan and the National Bank of Pakistan, government securities, interbank placements.	Deposit liabilities.
Sri Lanka	Prudential purposes, debt-management purposes.	LAR was introduced in late 1988, following the adoption of the New Banking Act; it has remained unchanged since then. Maintained on a day-to-day (continuous) basis.	20 percent (1994).	Cash, balances with licensed commercial banks, money at call in Sri Lanka, government securities with a maturity of one year or less, other assets as prescribed by the Monetary Board.	Total liabilities of commercial banks minus banks' liabilities with the central bank.
Taiwan Province of China	Prudential control.	LAR has remained unchanged since 1967. Maintained on a day-to-day (continuous) basis.	7 percent (1990).	Excess reserves, net due from banks, treasury bills, net holdings of negotiable CDs, banker's acceptances, commercial paper guaranteed by banks, government bonds, corporate bonds, and other securities approved by the central bank.	Deposit liabilities of commercial banks.

Country	Purpose	Comments	Features		
			Level 1/ (Year)	Eligible Assets	Base
Europe					
Cyprus	Monetary control, debt-management purposes.	LAR was actively used until January 1996, when it was abolished and replaced with a 7 percent reserve requirement.	27 percent (1995).	Cash, balances with the central bank (including those in fulfillment of the minimum reserve ratio), government treasury bills, net foreign assets.	Domestic currency demand, savings, and time deposits.
Malta	Monetary control.	LAR in effect since October 1990. Maintained on a day-to-day (continuous) basis.	30 percent, including 5 percent CRR (1994).	Cash, balances with the central bank (including those in fulfillment of the minimum reserve ratio), government treasury bills, net foreign assets.	Domestic currency demand, savings, and time deposits.
Turkey	Monetary purposes, debt-management purposes.	LAR reformed in April 1994, but increased slightly in January 1995.	30 percent on end-March 1994 domestic currency deposit liabilities; 3 percent on domestic currency deposit and nondeposit liabilities in excess of end-March 1994 stock; 3 percent on foreign currency deposits. 3 percent on foreign currency nondeposit.	Indexed government bond.	Domestic and foreign currency deposit and nondeposit (e.g., repurchases) liabilities of commercial banks.

Country	Purpose	Comment	Features		
			Level 1/ (Year)	Eligible Assets	Base
Western Hemisphere					
Argentina	Prudential purposes and monetary control.	In August 1995, the average reserve requirement system was effectively replaced with an average liquidity requirement.	18 percent on demand, savings and less than 90 day time deposits; 13 percent on more than 90 day and less than 180 day deposits; 7 percent on more than 180 day and less than 365 day deposits (1997).	Bank liquidity certificates (issued by the treasury, proceeds are to be deposited with the central bank), reverse repurchase agreements with the central bank, U.S. treasury bills and other foreign assets deposited in special accounts abroad.	Deposit and other liabilities.
Guyana	Monetary control.	The Bank of Guyana conducts biweekly auctions of treasury bills for monetary control purposes. Minimum liquid asset requirement.	25 percent on demand deposits; 20 percent on savings and time deposits (1997).	Currency; bankers' deposits at the Bank of Guyana (including cash reserve requirements); balances due from other commercial banks and from banks abroad; treasury bills.	Deposit liabilities.
Jamaica	Monetary control.	LAR eliminated gradually in the period 1986-88, but reintroduced in 1989.	22 percent (1996); in addition a 25 percent CRR.	Government securities, Bank of Jamaica securities.	Domestic currency deposits.
Mexico	Prudential purposes.	LAR was introduced in April 1989 (maintained on average); removed in a series of steps beginning September 1991. At that time, LAR was maintained on foreign currency liabilities (only enterprises are allowed to hold foreign currency deposits).	30 percent (1991) on domestic currency deposits; 15 percent (1996) on foreign currency liabilities.	Domestic currency liabilities; deposits at the Bank of Mexico, government paper (CETES and BONDES). Foreign currency liabilities; foreign currency cash and deposits at the Bank of Mexico, U.S. treasury bills, deposits abroad (even in subsidiaries of Mexican banks abroad).	Deposit liabilities. Foreign currency liabilities include: foreign currency deposits and foreign borrowing.

Country	Purpose	Comment	Features		
			Level 1/ (Year)	Eligible Assets	Base
Economies in transition					
Bulgaria	Prudential purposes.	Banks' liquidity is assessed on the basis of different liquidity ratios reflecting, for example, the bank's market position, the diversification of liabilities, and the bank's access to sources of funding.	N.A.	N.A.	N.A.
Czech Republic	Prudential purposes.	There are no norms for liquidity ratios. However, banks are required to manage their cash flows prudently, set up the necessary infrastructure (the adequacy of which is checked by the Czech National Bank), and report quarterly to the Czech National Bank a breakdown of their on- and off-balance-sheet items by residual maturity and currency.	N.A.	N.A.	N.A.
Estonia	Prudential purposes.	Maintained on a day-to-day (continuous) basis. Two liquidity ratios are maintained, one calculated as a percentage of current liabilities and another as a percentage of total liabilities.	30 percent (1995).	Highly liquid assets.	Current liabilities and total liabilities.
Georgia	Prudential purposes.	In addition to a short-term ratio, banks are required to hold a long-term ratio. The ratio of long-term loans (more than one year) to long-term deposits should not exceed 100 percent.	30 percent (1997).	Vault cash, balances in correspondent accounts, obligatory reserves, gold.	Total liabilities.
Latvia	Prudential purposes.	The liquidity rules require compliance with long-term and short-term liquidity ratios that stipulate a relationship between assets and liabilities according to their initial maturity. These requirements are modeled on the German approach.	N.A.	N.A.	N.A.

Country	Purpose	Comment	Features		
			Level 1/ (Year)	Eligible Assets	Base
Lithuania	Prudential purposes.	The ratio of liquid assets to liabilities at each maturity may not be less than 30 percent.	30 percent (1995).	Cash, money in transit, balances on correspondent accounts, required reserves on Litas, treasury bills, loans granted that are due in less than one month, precious metals.	Liabilities at each maturity include sight deposits, term deposits due to mature within 30 days, and balances on other creditor's accounts.
Mongolia	Prudential purposes.	LAR introduced in 1993 because banking supervision was just being established.	10 percent (1995).	Cash, deposits at the central bank, Bank of Mongolia bills, government securities, deposits in commercial banks.	Total borrowings.
Russia	Prudential purposes.	The ratio of marketable assets to demand liabilities must be at least 10 percent. In addition to the LAR, the total liquid assets of banks must be at least 20 percent of demand deposits and liabilities of up to 30 days (increasing gradually to 70 percent by February 1999); the ratio of loans with more than one-year maturity to capital plus liabilities with more than one-year maturity shall not exceed 120 percent.	10 percent (July 1996).	N.A.	Total assets.
Slovenia	N.A.	The central bank monitors the maturity match between banks' assets and liabilities.	N.A.	N.A.	N.A.
Turkmenistan	Prudential purposes.	In addition to the LAR, for liabilities with remaining maturity of less than a month, banks have to maintain assets of less than one-month maturity.	30 percent (1996).	Cash, deposits with the central bank, loans receivable within 30 days, treasury bills.	Liabilities of commercial banks.
Ukraine	Prudential purposes.	Each of the indicators of current, short-term and long-term liquidity (ratio between liquidity outflows and inflows) may not exceed unity.	N.A.	N.A.	N.A.

Sources: International Monetary Fund, various Recent Economic Developments; Basic Committee on Banking Supervision (1995).

1/ The liquid asset requirement level includes the cash reserve requirement when cash and deposits at the central bank are eligible assets.

2/ CNEL, a savings institution, collected funds and transferred them to the treasury in their entirety partly in exchange for development bonds.

3/ Cagamas is the national mortgage corporation established in 1986 to ensure a steady flow of funds to the housing industry as well as to develop a secondary mortgage market. While not a government agency, it has strong government backing.

SELECTED COUNTRY EXPERIENCES IN REFORM

This appendix examines the experience of five countries (Jamaica, Malaysia, Mexico, New Zealand, and Turkey) in reforming liquid asset requirements. These countries were chosen to include successful and unsuccessful stories in removing these requirements and thus contrasting their experiences highlight the conditions that facilitate the process of reform, particularly in countries where it is an important instrument. These conditions include tight fiscal and monetary policies, the development of government security markets, the adaptation of the regulatory and supervisory framework to market conditions and a sound banking system. More importantly, the experiences of these countries also highlight that the removal of the liquid asset requirement is usually part of a process of financial sector reform that includes a successful transition from direct to indirect monetary control.

A. Jamaica

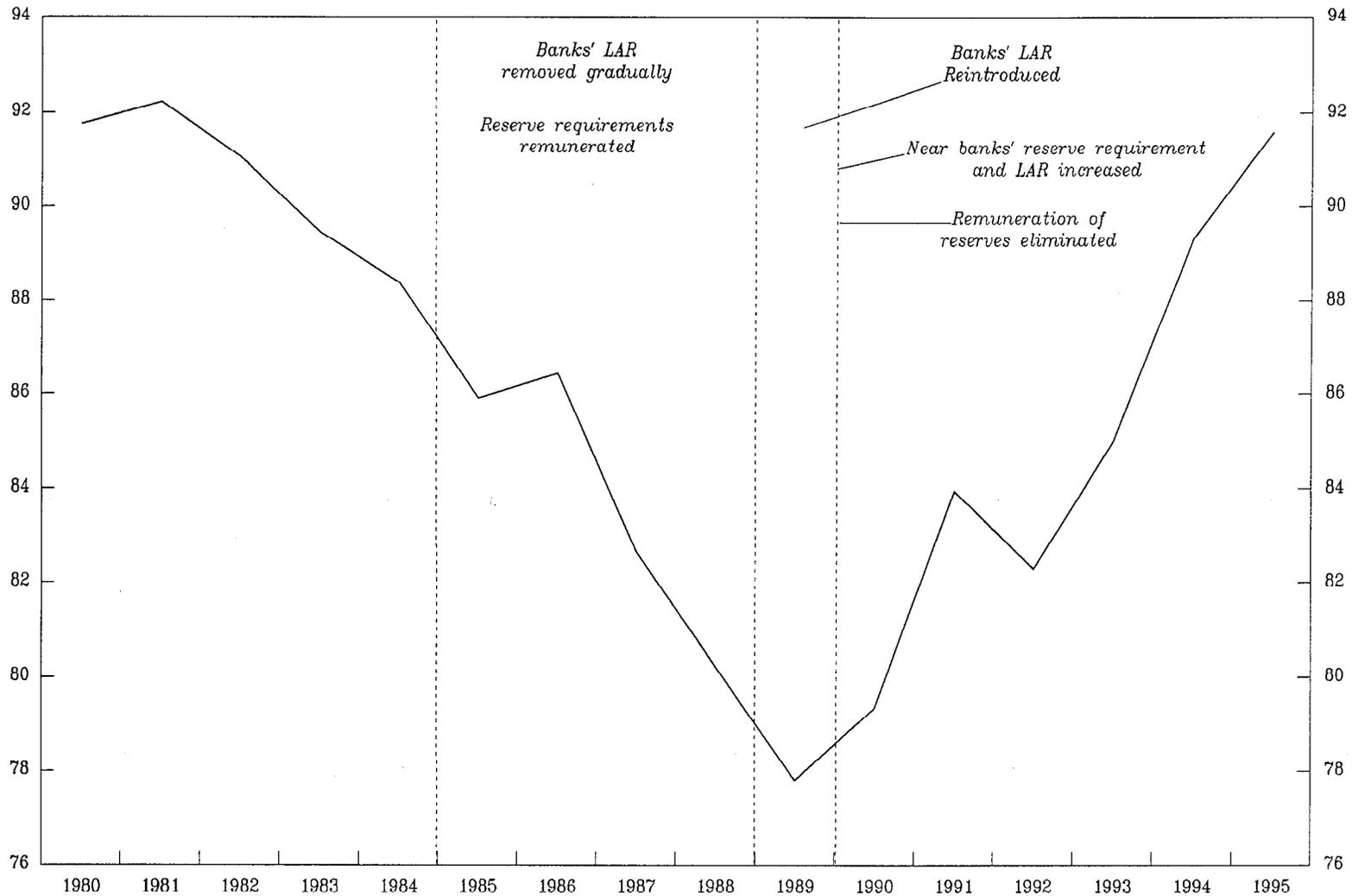
Jamaica's experience includes a reversal in reforming the liquid asset requirement in the presence of an excessively high consolidated public sector fiscal deficit and, at times, inconsistencies in implementing indirect monetary control.

Institutional and macroeconomic conditions

Prior to 1985, the system of monetary management mainly had involved direct controls including global credit ceilings, interest rate controls such as a statutory savings deposit floor rate and a maximum mortgage lending rate, a non-remunerated cash reserve ratio (which differed between commercial banks and nonbank financial institutions), a noncash liquid asset requirement, and selective credit controls.³² Until mid-1985, banks were required to hold almost 44 percent of deposit liabilities in liquid assets (including a 17.5 percent cash reserve ratio). Although government securities were sold through auctions, liquid asset requirements were imposed to create a captive market for government securities and to contain the interest cost of the government debt. It resulted in low yields on government paper and high interest rates on private sector loans which the authorities considered to be inconsistent with the policy objective of stimulating private sector led growth. Further, differential reserve and capital requirements between banks and nonbanks coupled with credit ceilings, applied on commercial banks only, resulted in bank disintermediation (Chart 1). During the early 1980s, there was an explosion of near banks as commercial banks sought to circumvent the high liquid asset requirement and also because the capital requirements for near banks was low vis-a-vis that required for banks.

³²In particular, directed credit operations through sector specific refinance windows operated by the Bank of Jamaica and activity specific credit ceilings. For a discussion of financial sector reform in Jamaica during 1985-92 see Marston (1995).

CHART 1
 JAMAICA
 DEPOSIT MONEY BANKS SHARE OF FINANCIAL SYSTEM DEPOSITS 1/
 (In percent)



Source: IMF, International Financial Statistics.

1/ Deposit money banks' deposits as a percentage of financial system deposits. Deposit Money Banks: consolidates the eight commercial banks operating in Jamaica and the Workers Saving and Loan Bank, formerly known as the Government Savings Bank, which performs commercial bank operations. Other Banking Institutions: comprises merchant banks and trust companies. Beginning March 1992, includes finance houses.

In the first half of the 1980s, Jamaica experienced large fiscal imbalances and economic activity was stagnant. Problems of large fiscal deficits (over 13 percent of GDP in fiscal year 1985/1986) were aggravated by a decline in world demand for bauxite—the country's major export sector— and by deteriorating export competitiveness as the exchange rate remained fixed from 1985 to 1988. Furthermore, negative real interest rates induced financial disintermediation and currency substitution. Although macroeconomic conditions improved after 1985, in the period 1988-89, the fiscal position of the government deteriorated substantially due mainly to an increase in public sector expenditure and a reduction in the operating surplus of enterprises involved in rehabilitation programs after a severe hurricane (Table 2). The central bank quasi-fiscal losses also deteriorated, particularly in the 1990s due mainly to interest payments on central bank securities used in OMO and on required reserves.

Pace of reform

During the period 1985-88, to address interest rate distortions, the liquid asset requirement was reduced gradually, and effectively replaced with a cash reserve requirement of 20 percent. Reflecting the curtailment of the captive market for government securities, the effective yields on treasury bills and other government paper increased.

However, after 1989, except for a brief period, there was a significant reversal in the above reform. The liquid asset requirement was reintroduced in July 1989, with a view to use it for monetary control purposes as the proceeds from the sales of Treasury securities eligible to satisfy the liquid asset requirement would be deposited in the central bank. Initially, the level was set at 20 percent, including a 19 percent CRR. To sustain the captive demand for government and central bank securities, from that time, the liquid asset requirement was increased, reaching 33.5 percent in January 1991. Thereafter, the liquid asset requirement was eliminated in April 1991, but reintroduced in November 1991. At that time, the liquid asset requirement was determined on a bank-by-bank basis based on each bank actual level as of November 1991; bank-by-bank levels were increased gradually according to a timetable established by the Bank of Jamaica. This situation remained until July 1992 when the liquid asset requirement for all commercial banks was set uniformly at 50 percent including a 25 percent unremunerated CRR. Later in mid-1995 the Bank of Jamaica lowered the liquid asset requirement to 47 percent, but unremunerated reserve requirement remain at 25 percent.

Supporting measures and reforms

The reform of the liquid asset requirement was part of a program to reform monetary management. The aim was to gradually liberalize interest rates, remove interest rate distortions and introduce indirect instruments of monetary control. In 1985, interest rate restrictions on lending were removed, the minimum saving deposit floor rate was indexed to the market determined time deposit rate and credit ceilings were eliminated. Simultaneously, open market type operations using Bank of Jamaica certificates of deposit were instituted as of November 1985, in the context of a reserve money program (Marston, 1995). In addition, reserve requirements were remunerated at close to market rates.

After a short period in which credit ceilings were in effect (1990), indirect instruments were reintroduced once again in 1991.³³ In 1991, the rediscount window was reformed to encourage secondary market trading rather than borrowing from the Bank of Jamaica, the rediscount rate began to be adjusted regularly and a quantitative ceiling on Bank of Jamaica rediscounting was instituted. Further, the Bank of Jamaica initiated a program to equalize the reserve requirements across financial institutions thus reducing the incentive for disintermediation (Marston, 1995). However, as explained above, the liquid asset requirement was maintained and used as a monetary instrument by including Bank of Jamaica securities among the eligible assets.

On the state of the financial system, there were no major banking problems during the late 1980s, these only occurred in the mid-1990s. In contrast, near banks had a much weaker financial position than commercial banks. As a result, one of them was closed in 1987.

Implementation experience

In Jamaica, the struggle to remove the liquid asset requirement, and more generally to vary the mix between direct and indirect instruments of control, was a direct consequence of sustained fiscal and quasi-fiscal disequilibria. In an attempt to sterilize the excess liquidity caused by these imbalances, the Bank of Jamaica tightened monetary policy by issuing certificates of deposits. However, the effectiveness of this instrument was undermined by an inconsistent interest rate policy. In mid-1988, the Bank of Jamaica was conducting interest rate tenders albeit with implicit (and unsustainable) interest rate caps (Marston, 1995). Monetary actions were thus insufficient to control credit growth, and the authorities responded by reintroducing direct controls.³⁴

Financial sector reforms had a generally positive effect on intermediation and banking efficiency. The reforms reversed bank disintermediation, which had been induced by the system of monetary management, where controls were applied exclusively on commercial banks (Chart 1). The deposit money banks' share of deposits declined continuously until 1989, shortly after reserve requirements were imposed on near banks. Eliminating bank-by-bank credit ceilings and extending reserve requirements on near banks undoubtedly helped to reverse the bank disintermediation trend. Regarding banking efficiency, net interest spreads fell from an average of almost 9 percentage points in the pre-reform period, to less than 8 percent in the 1985-89 period. This reflected at least in part, the remuneration of reserve

³³Direct instruments such as credit ceilings became ineffectual shortly after their reintroduction in 1990. The Bank of Jamaica granted numerous exemptions; also, banks circumvented credit ceilings through off-balance sheet transactions (Marston 1995).

³⁴In addition to reintroducing the liquid asset requirement, the Bank of Jamaica increased the floor on the minimum savings deposit rate from 13 to 18 percent in November 1989 and imposed credit ceilings on both banks and nonbanks effective in 1990.

requirements, the elimination of the liquid asset requirement, and increased competition made possible by the removal of credit ceilings in 1985 (Marston, 1995). However, after eliminating the remuneration of reserve requirements and increasing the liquid asset requirement, particularly after 1992, these requirements increased the banks' cost of funds and contributed to large interest rate spreads (over 15 percentage points measured in June 1993).

The development of the securities market over the period of reform was not so much constrained by the liquid asset requirement but rather by the willingness of the Bank of Jamaica to make a market on an artificial basis. The Bank of Jamaica traded at a predetermined price which was below market levels for long periods thus encouraging trading with the central bank instead of other market participants.

B. Malaysia

Malaysia is an interesting case study of struggles to reform the liquid asset requirement. Although the liquid asset requirement was reformed in the late 1980s, the surge in capital inflows during 1992-93 gave rise to a greater role for the liquid asset requirement as a monetary policy instrument. The level was roughly constant over the period, however the deposit base was widened to include foreign currency deposits and the eligible assets broadened to include Bank Negara Malaysia bills.

Institutional and macroeconomic conditions

Prior to 1985, the central bank (Bank Negara Malaysia) relied primarily on variations in the statutory reserve and liquidity requirements as the main instruments of monetary management.³⁵ Also, periodic changes in interest rates were an important tool. Since 1983, banks were required to peg all their lending rates to the base lending rate that was administered by the Bank Negara Malaysia.³⁶

Regarding money markets, the interbank market was not an important source of short-term funding for commercial banks. The government securities market was largely captive as the government relied on statutory investment requirements to fund part of its budgetary operations. These requirements distorted the interest rate structure of the financial system as financial intermediaries attempted to pass the implicit tax on holding government securities to borrowers through higher private sector lending rates. Secondary markets for government securities were virtually nonexistent because these securities were generally held until maturity to meet such requirements.

³⁵Before 1985, the liquidity ratio varied from as low as 20 percent to as high as 25 percent.

³⁶As revised at end-1995, the base lending rate was tied by a formula to interbank market rates; it acts as a ceiling on lending rates.

During the period 1985-86, a sudden and sharp deterioration in the terms of trade tightened liquidity conditions and had widespread deflationary effects. Inflation was almost nil and real interest rates were positive, but the fiscal deficit soared, to peak at 11.2 percent of GDP in 1986, declining to 3.8 percent of GDP in 1988. The soundness and stability of the financial system was severely tested as the commercial banks suffered a large overhang of nonperforming loans. Some banks suffered huge losses to the point of having a capital shortfall. Liquidity conditions eased after 1988. Since then, private capital inflows have been increasing in importance, reaching a peak in the period 1992-93.

Pace of reform

In 1985, given its limited effectiveness as an instrument of monetary policy, the liquid asset requirement was reformed to use it mostly for prudential purposes. After 1985, changes in the liquidity ratio played a much reduced role in the conduct of monetary policy. For commercial banks, the ratio has remained unchanged at 17 percent since its last downward revision in April 1985. During a transition period (1986-87), in view of the large fiscal imbalances, no other reforms in the liquid asset requirement were implemented. However, since 1987, the trend has been to ease the burden on financial institutions of carrying statutory reserves by allowing them more flexibility in meeting the requirements. In 1987, banking institutions were allowed to average their liquid assets over a bi-weekly reserve period to improve banks' liquidity management. For the purpose of compliance, only a variance of up to 2 percentage points below and above the minimum requirement would be taken into account in the computation of the liquid asset requirement. The base was also averaged; in 1990, banks were allowed to observe their liquid asset requirement based on an average daily amount of liabilities over a bi-weekly period, instead of on data for a single date. Apart from lowering the costs of operations of the financial institutions, these measures were also intended to dampen the volatility in the interbank market interest rates caused by banks seeking to meet the day-to-day (continuous) requirements (Ghani, 1995).

Supporting measures and reforms

The reform of the liquid asset requirement was part of a broader process of financial sector reform designed to increase reliance on indirect instruments of monetary policy, to provide the government with more flexibility in managing its debt and to develop money and capital markets.

During the 1980s and 1990s, interest rate controls as a monetary policy instrument gave way to a complementary mix of direct and indirect monetary instruments such as centralization of government funds in Bank Negara Malaysia (after 1990), borrowing in the interbank market

(1992) and issue of Bank Negara Malaysia bills (1993).³⁷ This shift in monetary management was in response to the increased capital mobility across geographical boundaries and the rapid growth of the financial system.

Recognizing the importance of having an active and viable secondary market for government securities, since late 1986, the Government introduced several regulatory and operational reforms in this market. The reforms aimed at deepening the market, facilitating the conduct of monetary policy and providing the government with more flexibility in the management of its debt. As a result, in 1987, the government revamped the pricing structure of Malaysian Government Securities (MGS) towards market-related pricing of primary issues.³⁸ Later, in 1989, issues of MGS of up to 10 years were auctioned through the principal dealers, except for issues purchased by the National Savings Bank and the Employee Provident Fund.³⁹ Other reform measures in this market were directed mainly at facilitating a faster and more efficient mechanism for the trading, registration and settlement of government securities.

As part of the financial sector reform, Bank Negara Malaysia also took measures to restore the health of the banking system. In particular, during the period 1985-86, its powers were enhanced through legislative amendments, to enable the Bank to institute effective remedial measures to avert any threat of systemic failure and to maintain public confidence in the banking system. These powers were invoked when Bank Negara Malaysia injected capital into three ailing banks, after having changed their boards of directors and top management. Moreover, Bank Negara Malaysia also assumed control of the business of another bank to facilitate a restructure of its capital.

In addition to dealing with banking institutions in financial distress, during the period 1989-93, Bank Negara introduced prudential reforms and regulations designed to strengthen banks. In particular, commercial banks were required to observe a risk-weighted capital asset ratio as of September 1989. Owing to significant capital inflows, Bank Negara was particularly concerned with the threat of an asset price bubble. Therefore, it endeavored to prevent the exposure of the banking industry to asset prices from leading to distress. In addition, it took measures to promote market discipline by establishing minimum standards for accounting practices and policies and disclosure requirements for banks. Also, an independent credit rating agency began grading banks on a voluntary basis.

³⁷A short-term paper issued by the Central Bank to mop up excess liquidity.

³⁸MGS have maturities ranging from 3 to 21 years. Since 1973, treasury bills, which have short-term maturities not exceeding one year, had already been sold in regular weekly tenders.

³⁹In 1989, the Bank Negara appointed a panel of principal dealers to conduct its OMO. The main responsibilities are to underwrite new issues of MGS and to provide two-way quotations in the secondary market. Only these dealers can access the Bank Negara's discount window.

Implementation experience

Although in the second half of the 1980s the liquid asset requirement was used mostly for prudential purposes, in recent years, there is some evidence of a renewed interest in it for monetary purposes as part of an effort to mop up the excess liquidity in the banking system caused by capital inflows. In 1993, liquid assets were redefined to include Bank Negara Bills. In addition, in 1994, the liability base used to calculate the liquid asset requirement was redefined to capture all inflows of funds from abroad by extending the liquid asset requirement to foreign currency deposits.⁴⁰ As a result, the banking system was required to keep about RM 2 billion in additional domestic liquid assets with Bank Negara.⁴¹

Although a number of public debt management reforms were designed to encourage the development of secondary markets, these efforts did not succeed. Government papers are still thinly traded. Over the years, the supply of government securities has not been able to match the growing demand. The demand by residents, mainly financial institutions, has increased in tandem with their growing liabilities; the demand by nonresidents has soared prompted by interest rate and exchange rate developments. In parallel, the government's borrowing requirement has progressively declined due to its improved financial position. Therefore, the scope for efficient and effective OMO in the government securities market, so far, remains limited.

However, the interbank market developed into an important source of short-term funding. The size of the market has expanded rapidly over the last 30 years, particularly after 1987, reflecting to a large extent the better management of funds among the banks and other financial institutions. Commonly traded money market papers include bankers' acceptances and negotiable certificates of deposits, with maturities including overnight, 7-day, and 1, 2, and 3 months (Bank Negara Malaysia, 1994).

As a result of the process of financial sector reform, financial markets in Malaysia have grown in sophistication and complexity and financial intermediation has deepened. The ratio of M2 over nominal GDP grew from 69 percent in 1985 to 82 percent in 1992. A further indication of the growing maturity of the financial system is the lengthening of maturity of various financial instruments. For instance, more than one year deposits as a percentage of total deposits increased from 0.8 percent in 1970 to 15.4 percent in 1992.

⁴⁰Prior to 1994, only domestic currency funds were subjected to the liquid asset requirement. This measure also increase the demand for bank reserves as the eligible liability base for reserve requirements is the same as that for liquidity requirements.

⁴¹Bank Negara also sterilize capital inflows by increasing reserve requirements in a series of steps from 7.5 percent in 1991 to 11.5 percent in 1994.

C. Mexico

In Mexico, the successful removal of the liquid asset requirement was supported by strong public finances and a reasonably well-working market for government securities. However, the Mexican case underscores that a liquid asset requirement may complicate indirect monetary management under cash reserves shortages and that banking supervision needs to be strengthened early in the reform.

Institutional and macroeconomic conditions

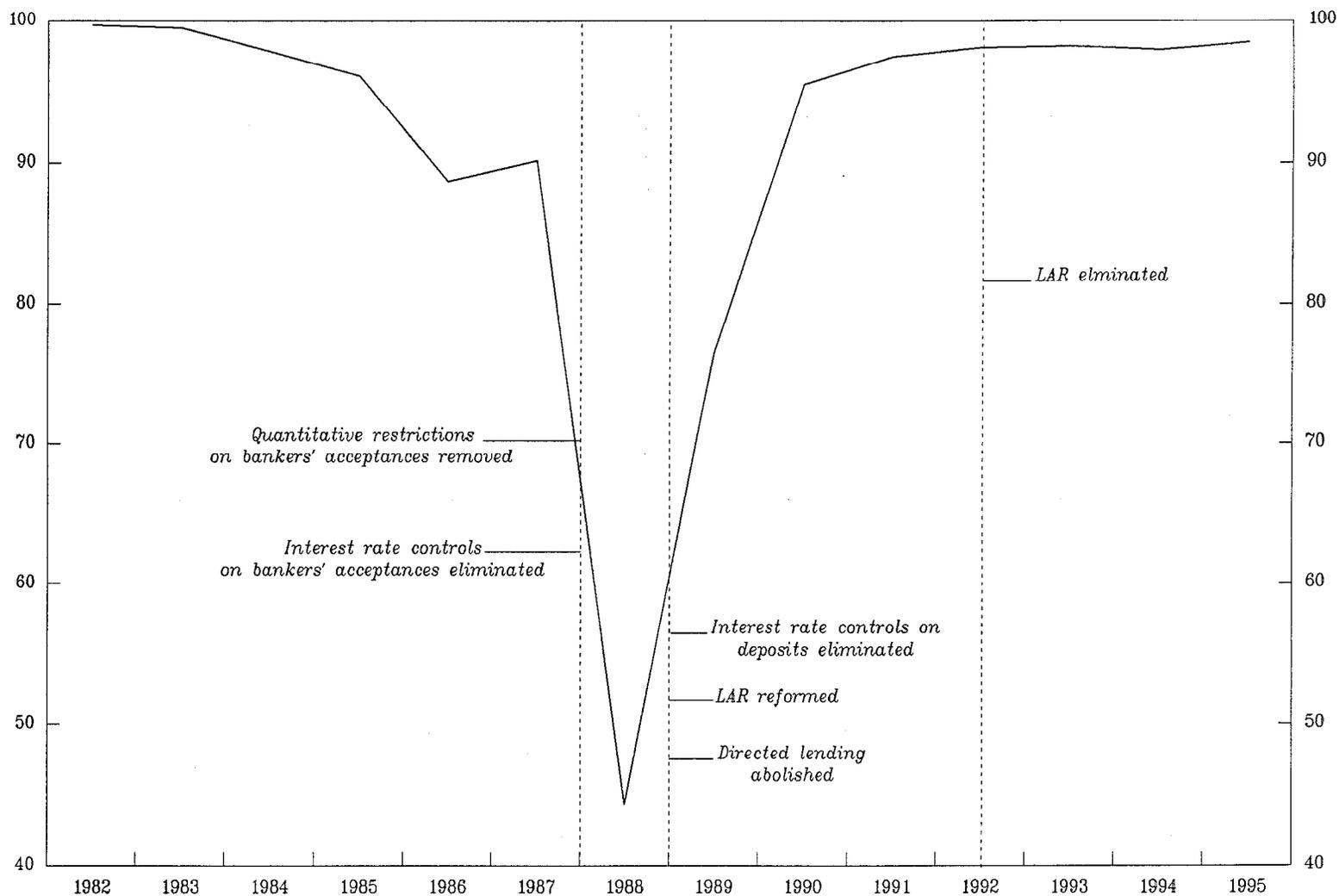
During the period 1982-88, direct controls on the financial system intensified and, as a result, the market for informal credit expanded. Banks were nationalized at the start of the period, after which their numbers declined from 60 to 18. The financial system was regulated by interest rate restrictions, quantitative restrictions,⁴² domestic credit controls, and high cash and liquid reserve requirements. In addition, banks were required to channel at least 50 percent of deposit liabilities to the government (inclusive of cash reserve requirements). Furthermore, a complex structure of interest rates and credit controls caused further distortions and inefficiencies (Alexander and others, 1995). For instance, the system of monetary management, where interest rate controls and high reserve requirements were applied primarily to banking deposits, induced banks to shift resources to financial instruments subject to less costly restrictions (Chart 2). This process intensified in 1988 when quantitative restrictions and interest rate controls were removed from nondeposit liabilities such as bankers' acceptances.

Notwithstanding, the market for government securities developed over this period. Certificates of the Treasury (CETES), a short-term debt instrument, auctions were introduced in 1978; however, the volumes offered were initially quite small and yields were fixed by the authorities. As of late 1982, participants were allowed to present their bids in terms of amounts and yields; after that, both the primary and the secondary markets for CETES began to grow rapidly.

In 1988, at the start of the reform process, there were large macroeconomic imbalances. Inflation was over 50 percent, real interest rates were barely positive and the fiscal deficit was over 11 percent of GDP. However, in this same year, the authorities implemented a comprehensive macroeconomic adjustment program. In four years, inflation was reduced below 20 percent and the high fiscal deficit turned into a small surplus. Liquidity conditions remained tight until 1989; however, during 1990-93, foreign capital inflows increased to more than 8 percent of GDP on an annual basis.

⁴²Prior to November 1988, there was a 100 percent reserve requirement against bankers' acceptances issued beyond an authorized limit (applied only on banks) (Coorey, 1992).

CHART 2
MEXICO
DEPOSIT MONEY BANKS SHARE OF DEPOSIT LIABILITIES 1/
(In percent)



Source: International Financial Statistics.

1/ Deposit liabilities of deposit money banks as a percentage of their total liabilities. Deposit money banks includes commercial banks and national credit corporations. Deposit liabilities include demand, savings and time deposits. End of period data.

Pace of reform

The banks' requirement to finance the government was removed in a series of steps starting in 1989. In April 1989, the compulsory requirements to finance the government were replaced with a 30 percent liquid asset requirement.⁴³ Banks were allowed to maintain this requirement on average in interest-bearing government paper—namely CETES and Federal Government Development Bonds (BONDES),—deposits at the Bank of Mexico, and vault cash.⁴⁴ Government paper held to satisfy the ratio would earn market interest rates and would be fully tradable.

However, in September 1991, given the structural shortage of liquid assets (see below), the removal of the liquid asset requirement was accelerated. At that time, it was lowered to 25 percent of the stock of deposits outstanding at the end of August 1991 and, from this date, additional deposits were exempted from the requirement. Initially, eligible securities remained the same, but at maturity banks were required to buy ten-year BONDES which could be traded with other commercial banks and the Bank of Mexico, and carried adjustable interest rates. However, in April 1992, banks were released from this obligation. The latter measure was intended to give banks wider room for maneuver to confront fluctuations in liquidity, increase the supply of loanable resources and foster a reduction in intermediation margins (Bank of Mexico, 1992).⁴⁵

Supporting measures and reforms

In Mexico, as in other countries, the removal of the banks' requirement to finance the government was part of the financial sector reform. Faced with disintermediation in financial markets and in the context of a macroeconomic adjustment program, the authorities, in late 1988, embarked on a major reform of the financial system. The reform aimed at increasing efficiency through greater reliance on market forces, promoting the growth and deepening of financial markets, and making monetary policy implementation more effective.

Supporting reforms included the development of indirect monetary instruments and of the government securities markets. In the early 1990s, the Bank of Mexico was able to rely on

⁴³This new requirement was applied on deposit liabilities; bankers' acceptances were subject to this requirement since November 1988.

⁴⁴BONDES are peso denominated treasury bills with maturity of one to two years that carry adjustable-rates and are indexed to inflation.

⁴⁵In April 1992, the Bank of Mexico also modified the liquidity requirement on foreign currency deposits. The compulsory liquidity coefficient on these resources, which went from 0 and up to 50 percent, was replaced with a 15 percent requirement to be held in foreign liquid assets issued by foreign governments or institutions.

OMO as the principal instrument of monetary policy. Also, to further develop its market for public debt, the Federal Government introduced in 1989 new debt instruments quoted in pesos but indexed to the exchange rate and to the consumer price index.⁴⁶

To shape a more efficient and competitive financial system and to foster sound financial practices, the government initiated a bank privatization process. At the time of the privatization, 15 banks had up to 34 percent of shares held by the private sector, while 3 were fully owned by the government. By mid-1992, all the commercial banks were privatized selling at considerably higher prices than initially expected by government officials.

Implementation experience

Mexico's experience underscores the difficulty of conducting outright operations under tight money market conditions and in the presence of the liquid asset requirement. By the end of 1991, it became clear that there was a structural shortage of liquid assets. As bank liabilities increased, the demand for government securities grew rapidly while their availability fell as public finances improved, aided by revenue from privatization and a reduction in nominal and real interest rates. In this context, in August 1991, commercial banks encountered increasing problems to satisfy their liquid asset requirements as some banks relied excessively on the resources corresponding to the liquidity coefficient to meet credit demands in pesos. The need to meet the liquidity coefficient by the end of August gave rise to a strong demand for government securities, as well as for the funds needed to buy them. As a result, short-term interest rates in the interbank market increased sharply. Under these conditions, the Bank of Mexico was compelled to inject reserves by purchasing large amounts of CETES at the primary auction, an operation which increased even more the shortage of liquid assets. To address the problem of a fundamental shortage of liquid assets, the liquid asset requirement was lowered to 25 percent and later eliminated, as explained above.

Mexico's case also underscores the need to strengthen banking supervision early in the reform process. Recently privatized banks had little experience and inappropriate organizational and information systems to assess credit and other market risks. At the same time, financial liberalization and the strengthening of public finances—which reduced the public sector's resort to bank credit—resulted in a shift in lending in favor of more risky borrowers. These developments together with the lack of proper supervision and inadequate regulatory standards, contributed to an increase in nonperforming loans.⁴⁷ In this context, the authorities strengthened banking supervision by introducing new criteria for rating credit portfolios and

⁴⁶For a description of government debt instruments in Mexico see Axilrod (1995), pp. 77-82.

⁴⁷Sachs, Tornell and Velasco (1996) claim that portfolios are weakened endogenously by swift expansions of credit: boom leads to bust. If so, this could also explain an increase in nonperforming loans as, in Mexico, there was substantive lending growth during the period 1990-1994 financed by capital inflows.

loan loss classification provisions. In March 1991, banks were required to classify the loans in their portfolios, and to create reserves according to the risk classification provisions. In addition, banks' capitalization standards were strengthened in accordance with the Basle Concordat. Banks were given a three year period, from 1991 to 1993, to attain those standards.⁴⁸ Despite the above measures, even before the end-1994 devaluation, Mexican commercial banks continued to experience a decline in asset quality. The proportion of risky credits net of provisions in relation to equity increased from 37 percent in 1992 to almost 50 percent by the third quarter of 1994.⁴⁹ In hindsight, the above banking supervision measures were insufficient and, after the financial crisis of late December 1994, the authorities reinforced this area by strengthening provisioning and capital requirements, establishing stricter limits on lending to related interests, and improving on- and off-site banking supervision.

The financial sector reform program including the reform of the liquid asset requirement allowed banks to compete effectively in financial markets and encouraged private savings in financial assets. It also reversed disintermediation. The deposit money banks' share of deposit liabilities declined continuously until 1988 but increased thereafter. This increase in the share of deposits occurred as interest rate controls on deposits were eliminated and the liquid asset requirement was reformed and uniformly applied on deposit and nondeposit liabilities (Chart 2).

D. New Zealand

New Zealand's experience in abolishing compulsory ratio requirements is of particular interest because of the scope of the reform, the speed with which it was implemented, and the absence of reversal.

Institutional and macroeconomic conditions

Prior to 1984 and especially in the immediately preceding years, New Zealand had widespread, financial sector regulations which segmented the financial market and reduced the effectiveness of monetary policy. These regulations included deposit and lending rate ceilings, credit growth guidelines, priority lending guidelines, restrictions on the types of activities different types of institutions could undertake, compulsory asset ratios and foreign exchange controls. The compulsory asset ratios, imposed on trading banks and other financial institutions, included a wide range of requirements to hold specified levels of government

⁴⁸Accordingly, between 1991 and 1993, banks' capital to asset ratio increased from 7.7 percent to 9.9 percent, and the ratio of provisions to total loans increased from 1.1 percent to 3.1 percent.

⁴⁹Risky credits are defined as the sum of credits graded C, D and E, where E represents the highest risk.

securities and other financial assets.⁵⁰ These requirements were used as an instrument of monetary policy—to affect the flow of credit—and to keep interest rates on government securities artificially low. There was, therefore, little incentive for the government to foster the development of secondary markets in government securities.

Those financial regulations and, in particular, the use of government security ratios encouraged disintermediation: financial flows were diverted to markets or institutions to which ratios did not apply (Reserve Bank of New Zealand, 1986). However, the impact of ratios had become increasingly noticeable in the 1970s and 1980s with the growing diversity of the financial system. More generally, the whole raft of direct controls discouraged competition among financial institutions, reduced the scope of financial services, and was akin to a tax on regulated institutions and activities—which affected their relative competitiveness. Furthermore, they created a conflict between monetary control and the maintenance of low interest rates.

Large macroeconomic imbalances at the start of the reform process called for a macroeconomic stabilization program. Although inflation was below 20 percent, it had persistently been substantially higher than New Zealand's main trading partners for well over a decade; real interest rates were low or negative; and external debt had risen substantially. A large fiscal deficit, financed indirectly by the Reserve Bank in part, compromised monetary control. As a result of the stabilization program, the deficit was more than halved, from 8.2 percent in 1984 to 3.6 percent in 1986, in two years. Liquidity conditions were heavily influenced by capital flows (notwithstanding the existence of exchange controls) until early 1985 when the authorities decided to float the currency.⁵¹

Pace of reform

The reform of compulsory asset ratios was swiftly implemented. In February 1985, all compulsory investment requirements imposed on the major groups of financial institutions were abolished essentially overnight.

Supporting measures and reforms

As in other countries, the abolition of the liquid asset requirement was part of a financial sector reform program. With the removal of interest rate controls in July 1984 and the

⁵⁰For details of the ratios imposed on the financial system see Reserve Bank of New Zealand (1986), p. 90.

⁵¹Since domestic liquidity was significantly affected by capital flows in 1984-85, the decision to float the exchange rate in March 1985 facilitated monetary control. For a discussion of monetary control issues during the transition from direct to indirect monetary control in New Zealand see Alexander and others (1995), p. 59.

adoption of a monetary policy involving greater emphasis on selling government debt at market interest rates, the abolition of the liquid asset requirement became possible. The removal of compulsory investment ratios was supported by tight financial policies. The government's indirect and direct access to central bank financing was curtailed and monetary policy was firmly oriented to obtaining price stability, backed subsequently by legislation ensuring the independence of the central bank. Moreover, pre-existing capital and short-term money markets, and a well-functioning payments system, also facilitated the reform, but the reform process itself contributed to the further development and to the increased competitiveness of financial markets.

The elimination of interest rate controls and compulsory asset ratios accompanied a change in monetary policy operating procedures. The new monetary policy framework aimed at influencing excess liquidity in the banking system. Operationally, this involved controlling the supply of "primary liquidity," an extended measure of bank reserves defined as settlement cash and government securities that could be discounted for settlement cash on demand.⁵² Effective control over primary liquidity involved the Reserve Bank engaging in OMO in non-discountable government securities. Liquidity management monitoring and forecasting systems were significantly strengthened, and focus on a range of indicators considered to be important for day-to-day monetary policy decision-making.

In the public debt management area, a market-based government debt strategy was implemented. Reserve Bank credit to the government to finance its deficit was cut-off. As a result, the government had to fully finance the fiscal deficit with the sale of (medium-term) government securities to the private sector, and since 1984, yields on government securities were fully market determined in auctions.⁵³

As part of the financial sector reform, the Reserve Bank was granted wider powers of supervision and information collection, and powers to facilitate the orderly exit or reconstruction of failing institutions to prevent system-wide problems.⁵⁴ As a result, the

⁵²The Reserve Bank had two primary policy instruments: the supply of settlement cash and the supply of automatically discountable government securities. The supply of settlement cash was controlled mainly through OMO, while the supply of discountable securities was controlled through regular tenders. In 1989, government securities were made non-discountable—Reserve Bank bills were issued instead, as the only instruments discountable on demand.

⁵³To insulate primary liquidity from fiscal influences, fiscal deficits were financed with medium-term, non-discountable securities.

⁵⁴In the 1986 amendment to the Reserve Bank of New Zealand Act, the Reserve Bank's supervisory powers were extended to cover banks and the larger nonbank financial

(continued...)

institutional and regulatory framework was revised. Prudential supervision was strengthened by introducing regulations on capital adequacy ratios, provisioning for doubtful loans, limits on loan concentration, collateral requirements and valuation standards, and by establishing adequate enforcement mechanisms. Further reforms in 1996 strengthened this framework by substantially increasing requirements on banks to publicly disclose credit and other market risks. These reforms emphasized market discipline by facilitating the role of the market in assessing the situation of individuals banks.

Two other important reforms were the opening of the payments system to competition by allowing any institution to open a settlement account at the Reserve Bank,⁵⁵ and the regulatory reform of near banks including especially community-owned (“Trustee”) banks. In the latter case, the reform removed all restrictions on their operations and phased out the government guarantee on their deposits. The latter reform was part of a supervisory policy that explicitly rejected government-mandated deposit insurance.

Implementation experience

A healthy banking system facilitated the reform and, more importantly, the speed with which the reform was implemented. The rise in interest rates that stemmed especially from the move to tighter monetary policies and the additional increase arising from the abolition of the liquid asset requirement reduced the value of the government securities’ portfolio of financial institutions. The portfolio of some banks and other financial sector firms were subject to a reduction in value, and thus financial institutions incurred some losses. Although some nonbank financial institutions were in a relatively weak financial position, most commercial banks and non banks were sufficiently sound, and thus were able to absorb the losses.

A positive externality of the financial sector reform including the abolition of compulsory asset ratios, was the further development and deepening of the main financial markets. Once controls on financial markets were lifted and the government moved to a policy of funding its deficit in the domestic markets without recourse to implicit central bank finance, secondary markets in government securities developed quickly, while money and foreign exchange

(...continued)

institutions. In the 1989 amendment, the Reserve Bank's responsibility for prudential supervision was confined to registered banks.

⁵⁵In practice, only registered banks have settlement accounts. The Reserve Bank is now contemplating effectively opening up its payments system to other institutions.

markets also deepened significantly further. In this, the Reserve Bank took a hands-off approach—following the principle that creating the right environment was the best way to stimulate economic activity and the development of markets.⁵⁶

E. Turkey

Although, in Turkey, the macroeconomic situation favored a gradual reduction in the liquid asset requirement, a weak banking system actually accelerated the reform to reduce the distortionary effects of the liquid asset requirement including the implicit tax imposed on the banking system. In 1994, the Central Bank of Turkey reformed the liquid asset requirement by eliminating this requirement on the flow of deposits as of April 1994 while maintaining it on the stock of deposits. However, in 1995, in the context of continued macroeconomic imbalances, the Central Bank of Turkey reintroduced it on the flow of deposits—albeit at low levels.

Institutional and macroeconomic conditions

During the period 1981-91, financial liberalization measures were implemented within a market-based economic strategy. Before 1980, Turkey's financial system was highly repressed by negative real interest rates, credit rationing and excessive reliance on central bank resources for public sector financing. All deposit rates, and to a large extent loan rates, were determined directly by the government, with no relation with the current inflation rate. Moreover, priority sectors, such as those producing import substitutes, could access subsidized resources under a number of complex and selective credit schemes.

The initial attempts to liberalize interest rates ended in a financial crisis in 1982 when some of the smaller banks and most of the brokerage houses collapsed. For other financial institutions, the magnitude of nonperforming loans became a major problem. In reaction to the crisis, the reform process slowed down. In particular, interest rates were brought, once again, under the control of the central bank. Nonetheless, financial market reforms continued throughout the decade, in part benefitting from the lessons learned from these early attempts.

The liquid asset requirement was maintained throughout this decade of reforms. This requirement was imposed mostly to create a captive market for government securities, to contain the interest cost of the government debt, and to lengthen the maturity structure of government securities. Before April 1994, banks were required to hold 30 percent of deposit liabilities in government bonds and Treasury bills with a weighted average maturity of at least 210 days—a longer average maturity than that of commercial banks' deposits. As a result of this forced interest rate risk exposure, many banks suffered large losses when interest rates

⁵⁶For a more detailed discussion, see Swinburne (1993).

rose unexpectedly in early 1994.⁵⁷ Moreover, at that time, the liquid asset requirement had already lost effectiveness as banks moved away from deposit liabilities toward nondeposit liabilities, such as repurchase agreements and asset-backed securities.

During the same period, 1981-1991, the Turkish economy has registered relatively high growth rates (about 5 percent per annum), aided by an outward oriented strategy. The performance in restoring internal balances, however has been disappointing. Inflation has averaged 60 percent throughout the 1980s, reflecting the lack of a strong and sustained fiscal adjustment program, combined with continued reliance on domestic financing. The public sector borrowing requirement (PSBR) rose from an average 4-5 percent in the first half of the 1980s to about 10 percent in the early 1990s, with the share of government consumption also rising during the period (Agénor and others, 1997).

In recent years, the Turkish economy has experienced sharp fluctuations in growth, and high and persistent inflation. Reflecting lax financial policies, annual inflation has remained at about 80 percent. Moreover, although the PSBR has somewhat declined it still remains high at around 8 percent of GDP in 1995.

Pace of reform

Despite the above macroeconomic imbalances, the Central Bank of Turkey implemented a comprehensive reform of the liquid asset requirement in April 1994. This reform sought to lay the basis for a sustained reduction, over time, in the burden that those requirements imposed on financial intermediation and to eliminate the discriminatory treatment of deposit and nondeposit liabilities.⁵⁸ The liquid asset requirement on the end-March 1994 stock would continue at 30 percent, but the eligible assets included only a specific type of government bond, indexed to the wholesale price index (WPI) and bearing an interest rate of 6 percent. In addition, banks would continue to maintain 2 percent of the end-March 1994 stock of deposits in the form of free reserves. Increases in deposits above the end-March 1994 level were exempt from any liquid asset requirement.

Nine months after the reform, the Central Bank of Turkey reversed its policy and reintroduced the liquid asset requirement, albeit at a low level. On January 5, 1995, the Central Bank of

⁵⁷The 1994 depreciation of the lira also imposed large losses on many banks, most of which had net short foreign exchange positions (foreign exchange liabilities exceeded foreign exchange assets).

⁵⁸The reserve requirement system was also reformed. Reserve requirements on the end-March 1994 stock of deposit liabilities remained unchanged, 16 percent on sight deposits and 7.5 percent on time deposits. However, the increase in, both, deposit and nondeposit liabilities above end-March 1994 levels were subject to the following requirement: 8 percent of the inflow had to be held in a non-interest bearing account at the Central Bank of Turkey.

Turkey announced that deposit and non-deposit liabilities in excess of the end-March 1994 stock were subject to a 3 percent liquid asset requirement. These requirements were met through holding one-year lira-denominated indexed government bonds, similar to the type used to meet the pre-existing liquid asset requirement on the March 1994 stock of deposits. These changes also covered liabilities denominated in foreign exchange. As of March 1995, banks were required to hold 3 percent of all foreign exchange deposits, in addition to 3 percent of the increase in foreign exchange nondeposit liabilities above end-March 1994 levels. Eligible assets included the same government bond, but it could be indexed to the WPI or to a foreign currency.

In mid-1996, the Central Bank of Turkey introduced changes in reserve and liquidity requirements to simplify the system and eliminate differences in treatment between domestic and foreign currency deposit and nondeposit liabilities, while leaving average levels of these requirements unchanged.

Supporting measures and reforms

By the time the reform of the liquid asset requirement began, a number of measures had already been implemented to foster the development of the interbank and government securities market. Initially, preference was given to develop the government securities market so as to provide banks with an adequate collateral for interbank operations. To promote the development of a government securities market, auctions of these securities started on May 1985 for maturities of up to one year. Although the funding costs of the Treasury increased, private borrowers benefitted because commercial banks could no longer make up what they were losing in their lending to the government at below market rates from their lending to the private sector (Saracoglu, 1995). Nevertheless, at times, the Treasury has been reluctant to make visible the true costs of financing the deficit. For instance, in late 1993, it increased its reliance on Central Bank of Turkey financing and scaled back its market-based borrowing, thereby seeking to limit the pressure of its heavy financing needs on its own interest bill. Similarly, in late 1995, immediately prior to elections, the Treasury relied heavily on Central Bank of Turkey advances to meet its financing needs.

The interbank money market which was organized by the Central Bank of Turkey started in April 1986. The Central Bank of Turkey acted as an intermediary such that the parties to a transaction did not know each others' identity. The Central Bank of Turkey operated as a broker, that is it borrowed only when it could on-lend the proceeds at the same interest rate.⁵⁹ The system was useful in that it provided the Central Bank of Turkey with information on liquidity conditions in the banking system. However, the development of the market was constrained by the Central Bank of Turkey's participation.

⁵⁹The Central Bank of Turkey charged a brokerage commission to both parties in a transaction because it assumed the credit risk.

The broadening of the secondary market in government securities led in 1987 to the use of outright purchases and sales of government securities by the Central Bank of Turkey to regulate banks' liquidity. However, the implementation of monetary management in the government securities market was impaired by the thinness of markets and by the impact of such operations on the cost of government borrowing. Therefore, until 1994, the Central Bank of Turkey primarily conducted OMO in the interbank money market (Central Bank of the Republic of Turkey, 1994). However, as the development of the interbank market was constrained by the Central Bank of Turkey's participation, the Central Bank of Turkey increasingly has relied on repurchase operations with government securities to control liquidity. For instance, in 1995, the Central Bank of Turkey actively used reverse repurchase agreements to sterilize liquidity caused by capital inflows.

At the time of the reform of the liquid asset requirement, many steps had already been taken to modernize banking supervision and introduce modern prudential regulations. Since the late 1980s, prudential regulations are being harmonized with European Union standards. In 1988, international standards for the classification of loans and for provisioning of non-performing loans were introduced. The capital adequacy ratio was introduced in 1989 and gradually phased-in over three years. In February 1995, additional regulations were introduced that changed the definition of capital/asset ratios in terms of risk-weighted assets in conformity with international standards. Limits on credits to related parties were tightened in 1994 and stronger public disclosure requirements were implemented.⁶⁰ In February 1995, the authorities imposed a 50 percent limit on the net foreign asset position of commercial banks. However, further strengthening of prudential regulations is required. Banks have an incentive to under-report nonperforming loans due to tax regulations on loan provisioning. Limits on credits to related parties remain well in excess of international standards and the limit on the net foreign asset position of commercial banks exceeds EU standards which range from 20 to 40 percent.

Given the weak position of commercial banks, the government took several measures to prevent further losses in the banking system. In particular, three small to mid-sized banks were forced to close in April 1994. In addition, the government's decision to provide full backing to all household deposits with domestic banks effectively prevented deposit withdrawals, albeit at the cost of introducing significant problems of moral hazard.

Implementation experience

In Turkey, the continued usage of the liquid asset requirement seems to have been motivated in part by the need to limit the borrowing cost of the government. However, by requiring banks to hold a set fraction of their liabilities in indexed government securities and to hold unremunerated reserves at the Central Bank of Turkey, these regulations impose costs on the banks that act as a tax on financial intermediation, reflected in a wide spread between

⁶⁰Banks were obliged to have financial statements audited externally before publishing them.

borrowing and lending rates. Central Bank of Turkey estimates indicate that in the first half of 1996 these requirements added, on average, some 11 percentage points to the overall cost of deposits while deposit rates were over 110 percent.

REFERENCES

- Agénor, Pierre-Richard, C. John McDermott and E. Murat Ucer, 1997, "Fiscal Imbalances, Capital Inflows and the Real Exchange Rate: The Case of Turkey", IMF Working Paper 97/1 (Washington: International Monetary Fund).
- Alexander, William and Francesco Caramazza, 1994, "Money Versus Credit: The Role of Banks in the Monetary Transmission Process," in *Frameworks for Monetary Stability*, ed. Tomás J. T. Baliño and Carlo Cottarelli (Washington: International Monetary Fund).
- Alexander, William E., and others, 1995, *The Adoption of Indirect Instruments of Monetary Policy*, IMF Occasional Paper No. 126 (Washington: International Monetary Fund).
- Axilrod, Stephen, 1995, "Transformation of Markets and Policy Instruments for Open Market Operations," IMF Working Paper 95/146 (Washington: International Monetary Fund).
- Baliño, Tomás J.T. and Charles Enoch, 1997, *Currency Board Arrangements. Issues, Experiences, and Implications for IMF-Supported Programs*, IMF Occasional Paper No. 151 (Washington: International Monetary Fund).
- Bank of Mexico, 1992 and 1993, *The Mexican Economy* (Mexico).
- Bank Negara Malaysia, 1994, *Money and Banking in Malaysia* (Kuala Lumpur).
- Basle Committee on Banking Supervision, 1992, *A Framework for Measuring and Managing Liquidity* (Basle).
- Basle Committee on Banking Supervision, 1995, *Report on Banking Supervision in Central and Eastern European Countries*, Prepared by the Group of Banking Supervisors from Central and Eastern European Countries (Basle).
- Central Bank of the Republic of Turkey, 1994, *Annual Report*.
- Clark, Larry, 1985, "Another Look at the Secondary Reserve Requirement as an Instrument of Monetary Policy," *Quarterly Review of Economics and Business*, Vol. 25, No. 1 (Spring), pp. 96-109.
- Coorey, Sharmini, 1992, "Financial Liberalization and Reform in Mexico," in *Mexico: The Strategy to Achieve Sustained Economic Growth*, ed. by Loser, C. and E. Kalter, IMF Occasional Paper No. 99 (Washington: International Monetary Fund), pp. 37-48.

- Dean, James W., 1975, "The Secondary Reserve Requirement as an Instrument of Monetary Policy," *The Manchester School of Economic and Social Studies*, Vol. 43 (March), pp 68-88.
- Ghani, Zamani A., 1995, "Malaysia: Development of the Money Market, Interest Rate and Financial Reforms", paper presented at the seminar on Interest Rate Liberalization and Money Market Development, Beijing, July 31-August 9.
- Gulde, Anne Marie, 1995, *Liquid Assets Ratios—An Effective Policy Tool?*, MAE Operational Paper 95/04 (Washington: Monetary and Exchange Affairs Department, International Monetary Fund).
- Hardy, Daniel, 1993, "Reserve Requirements and Monetary Management: An Introduction," IMF Working Paper 93/35 (Washington: International Monetary Fund).
- Hodgman, Donald R., 1972, "Selective Credit Controls," *Journal of Money, Credit and Banking*, Vol. 4 (May), pp. 342-359.
- Hörngren, Lars., 1985, "Regulatory Monetary Policy and Uncontrolled Financial Intermediaries," *Journal of Money, Credit and Banking*, Vol. 17, No. 2 (May), pp. 203-219.
- Johnston, R. Barry and Odd Per Brekk, 1989, "Monetary Control Procedures and Financial Reform: Approaches, Issues, and Recent Experience in Developing Countries," IMF Working Paper 89/48 (Washington: International Monetary Fund).
- Machinea, José Luis, 1996, "The Argentine Financial Crisis of 1995: Causes, Characteristics and Lessons" (unpublished).
- Marston, David, 1995, "Financial Sector Reform in Jamaica During 1985-1992: Possible Lessons for the Caribbean," IMF Working Paper 95/90 (Washington: International Monetary Fund).
- Myhrman, Johan, 1973, "An Analytical Treatment of Swedish Monetary Policy," *Swedish Journal of Economics*, Vol. 75, No. 3 (September), pp 221-237.
- Pecchioli, Renato M., 1987, *Prudential Supervision in Banking: Trends in Banking Structure and Regulation in OECD Countries* (Paris: Organization for Economic Cooperation and Development).

Sachs, Jeffrey, Aaron Tornell and Andrés Velasco, 1996, "Financial Crises in Emerging Markets: The Lessons from 1995"; *Brookings Papers on Economic Activity: 1*, Brookings Institutions, pp. 147-215.

Saracoglu, Rüşdü, 1995, "Liberalization in Turkey within the Context of Financial Sector Reform," paper presented at the seminar on Interest Rate Liberalization and Money Market Development, Beijing, July 31-August 9.

Swinburne, Mark, 1993, "Monetary Reform in New Zealand, 1984-1992: Markets, Instruments and Institutions," in *Financial Deepening and Economic Growth in the Pacific Basin Economies*, Wenyong, Yang and Zhang Fengming, eds., papers presented at the Tenth Pacific Basin Central Bank Conference, Beijing, Foreign Languages Press, People's Republic of China, October 12-16.

Reserve Bank of New Zealand, 1986, *Financial Policy Reform* (Wellington).