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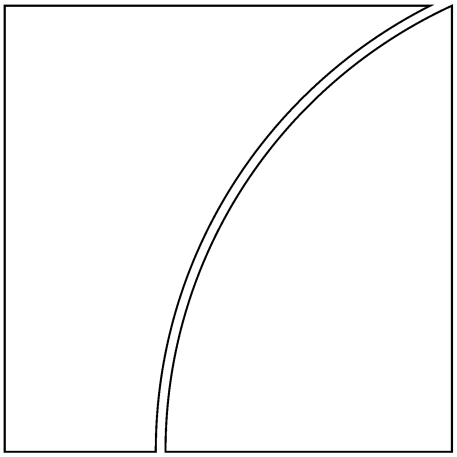

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Bond markets in emerging economies: an overview of policy issues

Philip Turner

1. Introduction[1]

Central banks have multiple interests in the development of bond markets. At a fundamental level, the government bond markets help to fund budget deficits in a non-inflationary way and so enhance the effectiveness of monetary policy. In addition, many central banks use government bond markets for the conduct of monetary policy. They often act as agents for the government in various aspects of the management of government debt. They oversee clearance and settlement systems, and they are responsible for the stability of the financial system, often directly supervising banks. This multiplicity of interests means that the policy issues that arise are very diverse. Many of them were considered by a small group of central bankers at the BIS during a two-day meeting in December 2001. This paper summarises some of the more important issues discussed in this volume.

There has been a very large increase in emerging market debt securities outstanding during the past few years. For emerging markets as a group, outstanding bonds amounted to 36% of GDP in 2000, compared with only 24% in 1994 (Table 1). During this period, the proportion of short-term debt in Latin American domestic debt has fallen appreciably.

Table 1

Recent developments in securities markets

	Outstanding[1]		**Short-term debt as a percentage of total debt**			
			domestic securities		**international securities**	
	1994	**2000**	**1995**	**2000**	**1995**	**2000**
Asia	26	39	19	22	5	6
Latin America	22	37	53	37	12	7
Central Europe	24	24	15	15	...	...
Total	24	36	29	25	9	6

[1] International and domestic bonds as a percentage to GDP.

Source: See Mihaljek, Scatigna and Villar in this volume.

[1] This overview in particular, and the volume in general, has greatly benefited from the cooperation, comments and statistical input of the central banks represented at the meeting. Thanks go to Steve Arthur, Marc Klau and Michela Scatigna for the tables and graphs, to Patricia Mosquera and Tracy Provenzano for secretarial assistance, to Nigel Hulbert, Arwen Hopkins, Tom Minic and Alison Spurway for editorial suggestions and to Liliana Morandini for production assistance with the whole volume. Helpful comments were received on this paper from Eli Remonola, Bill White and the authors of the BIS papers in this volume. Particular thanks are due to Peter Stebbing, who made extensive comments and suggestions. Opinions expressed are those of the author and not necessarily shared by the BIS or the central banks involved.

2. Debt markets: some general policy issues

2.1 Why develop debt markets?

The motivations for developing debt markets are partly specific (related to satisfying particular borrowing needs efficiently) and partly general (related to making financial markets function more effectively).

The prime specific reason for developing a bond market in most countries was to finance fiscal deficits. Under the highly regulated financial regimes prevalent before the 1980s, governments in many emerging markets could meet much of their borrowing needs by simply forcing local banks to hold government paper, usually to meet demanding reserve requirements. In many countries, inflation "financed" part of the government deficit. Foreign borrowing was also a possibility. The exchange rate risk of such borrowing appeared, in an earlier world of fixed exchange rates, relatively small. Such methods of financing have been undermined by the progressive liberalisation of financial markets and of capital flows worldwide, the adoption of anti-inflationary policies and the adoption of flexible exchange rates. Governments were increasingly forced to borrow from domestic markets. In addition, several countries have faced the need to finance very large extraordinary expenditure. The finance required for bank restructuring has been one recent example in many emerging markets.

A second specific reason for developing a local bond market was the need to sterilise large capital inflows. This was a particularly difficult challenge for several central banks during the first half of the 1990s. In the absence of well developed bond markets, the central bank has only short-term debt instruments at its disposal in conducting open market operations. Sterilisation that relies exclusively on issuing short-term paper tends to drive up short-term interest rates and encourage further inflows into such paper. This risks biasing the structure of inflows towards the short end. Sterilisation through the sale of bonds reduces such a risk. [2]

Although the specific impetus for developing bond markets came mostly from the public sector, borrowers in the private sector also need access to long-term finance, either directly from capital markets or mediated by banks. Corporations need to finance fixed investment projects that are expected to yield returns only in the long-term. Households' acquisition of houses is another example. In some cases, then, it was specific private demands for finance that furthered the development of debt markets.

There are several general reasons for developing debt markets.[3] The most fundamental reason is to make financial markets more complete by generating market interest rates that reflect the opportunity cost of funds at each maturity. This is essential for efficient investment and financing decisions. Moreover, the existence of tradable instruments helps risk management. If borrowers have available to them only a narrow range of instruments (eg in terms of maturity, currency, etc), then they can be exposed to significant mismatches between their assets and their liabilities. If bond markets do not exist, for instance, firms may have to finance the acquisition of long-term assets by incurring short-term debt. As a result, their investment policies may be biased in favour of short-term projects and away from entrepreneurial ventures. If firms attempt to compensate for the lack of a domestic bond market by borrowing in international bond markets, they may expose themselves to excessive foreign exchange risk.

The risks entailed by such mismatches have to be managed and the ability to do so will often depend on whether certain exposures can be adequately hedged. The availability of such hedges tends to be larger the wider the range of financial instruments actively traded in markets.[4] Liquid markets help financial market participants to hedge their exposures. As risks are spread across many participants – and not concentrated on a few – and as risks can be transferred to entities best placed to bear them,

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[2] Frankel (1993) provides a good summary of these issues.

[3] For a good exposition on why bond markets are central for financial development, see Herring and Chatusripitak (2001).

[4] This is not always the case. One important factor is that banks can provide such hedges to the extent their business generates natural hedges.

the costs of intermediation are reduced and the financial system can be made more stable. The need to strengthen the financial system in this way becomes all the greater as capital account liberalisation progresses. If capital inflows are forced into short-term obligations (bank deposits or securities) because longer-term paper does not exist, the vulnerability of the capital-importing nation to sudden reversals will be all the greater.

A second general reason for developing bond markets is to avoid concentrating intermediation uniquely on banks. Since banks are highly leveraged, this may make the economy more vulnerable to crises. The damage caused by such crises to the real economy is generally much higher, and the restructuring process more difficult, in the absence of a well functioning bond market. However, only well developed capital markets can realistically be expected to substitute for banks. For many – probably most – emerging markets, bank intermediation continues to dominate.

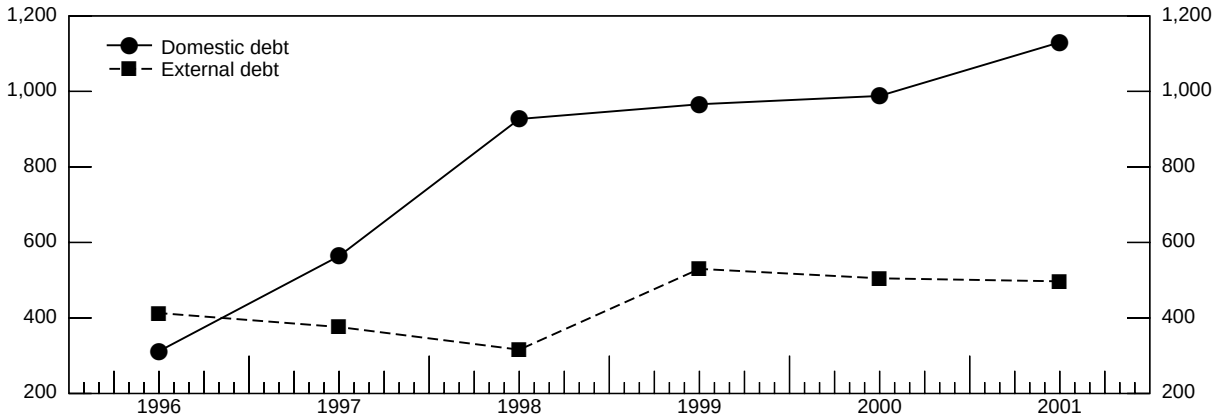
A third general reason for fostering debt markets is that such markets can help the operation of monetary policy. A well functioning money market is essential for the smooth transmission of policy as monetary policy relies increasingly on indirect instruments of control. In addition, prices in the long-term bond market give valuable information about expectations of likely macroeconomic developments and about market reactions to monetary policy moves.

2.2 Switching from international to domestic debt securities

A key question is how far the domestic market can become a viable alternative to reliance on international bonds. Many would agree that the scope for relying more on domestic markets, and less on international markets, is considerable in many emerging economies. In aggregate, the outstanding volume of domestic debt issued by emerging market entities has indeed risen significantly relative to international debt.[5] Moreover, one recent estimate suggests that the total international trading in emerging market domestic debt is now larger than trading in international bonds, even though international bonds are still much more liquid instruments. Graph 1 illustrates one assessment of the relative sizes of international and domestic debt that is tradable.

Graph 1

Emerging market tradable debt[1]



[1] In billions of US dollars.

Source: Merrill Lynch (2002).

Several reasons have been put forward to explain this trend. One is that conscious efforts have been made to improve the infrastructure for bond trading (including taxation reform) and to carefully tailor issuance policy to the needs of enhancing secondary market activity. A second reason is that lower

[5] Domestic bonds outstanding in emerging markets for which data are available rose from 20% of GDP in 1994 to 29% of GDP in 2000. See Mihaljek, Scatigna and Villar in this volume.

rates of inflation in many countries have made domestic-currency debt more attractive to investors.[6] The paper by Mihaljek et al in this volume does indeed find clear evidence that lower inflation is associated with longer average maturities of government bonds.

In some cases, the domestic market has also been used to float dollar-denominated debt. There have been reports that difficulties experienced in international markets in recent years (wider credit spreads, the periodic drying-up of liquidity) have led some local borrowers to float dollar-denominated bonds in local markets.[7] It has also been noted that the demand for dollar-denominated paper – which can be used to hedge foreign exchange exposures – rises when the exchange rate floats.

2.3 Structure of domestic debt and risk exposures

It was a commonplace that debt in many emerging markets was too short-term, tended to be at floating rather than fixed rates and was generally denominated in foreign rather than domestic currency. These features have exacerbated several crises in the emerging markets.[8] Considerable efforts have been made to improve the structure of domestic debt securities. Hence the question: how far have these features been corrected during the past few years?

Although the proportion of total domestic debt securities that is short-term has fallen in recent years, it is still relatively high. In Latin America, 37% of domestic debt securities were short-term in 2000, down from 53% in 1995, but still higher than in Asia or central Europe. Moreover, 28% of debt was inflation indexed in 2000 and 22% was linked to the exchange rate. In Asia, however, debt is more long-term and relatively little is indexed to inflation or the exchange rate. Floating rate debt remains a high proportion of total debt (Table 2).

Table 2

Type of domestic debt at issuance

(percentage of total at end-2000)

	Floating rate	Fixed rate	Inflation indexed	Exchange rate linked
Asia	35	63	0	2
Latin America	34	16	28	22
Central Europe and other[1]	13	65	20	2
Total	**27**	**48**	**16**	**9**

[1] Includes Saudi Arabia and Israel.

Sources: Calculated by normalising to 100 the data from Table 6 on page 27.

Some countries have changed the structure of their marketable debt in stages. For instance, Mexico moved away from dollar-linked debt towards inflation-linked or floating rate debt after the 1994 crisis. More recently, the government has issued marketable long-term fixed rate debt. This experience raises a more general issue of sequencing, that is, how far the development of "better" debt structures needs to proceed in stages. For instance, it will often be difficult for countries with a history of high and volatile inflation to move from dollar-linked to classical fixed rate nominal debt in one step. Many have found that some form of indexation or recourse to floating rate debt was a desirable transitional phase.

[6] However, not all domestic debt is denominated in domestic currency.

[7] The paper by Cifuentes, Desormeaux and González in this volume reports that for local borrowers issuance costs in local markets have been as little as one seventh of those in international markets. They find that the local market is open all year, while placing debt in the foreign market requires a "window of opportunity".

[8] See, for example, Financial Stability Forum (2000).

Brazil is an important recent case in point of a country striving to develop a more sustainable debt structure in stages. At the end of 1999, the Treasury and the Central Bank of Brazil set a number of guidelines for domestic debt management, including: the lengthening of the average maturity of debt; an increase in the share of fixed rate securities; and a reduction in the share of dollar-linked or overnight rate-linked debt. Some progress in achieving these aims was made during 2000 and (for some of the objectives) part of 2001.

But the more difficult international and macroeconomic environment during 2001 created dilemmas for the authorities, resulting in some policy choices that led to a partial reversal of the earlier movement away from dollar-linked debt. As many countries have grappled with such dilemmas, they merit some consideration. First, there is the dilemma that arises in attempting to reduce foreign currency issuance after a major depreciation in the exchange rate. The Brazilian currency depreciated sharply (about 40% from end–2000 to September 2001). This depreciation had the mechanical effect of increasing the share of outstanding foreign currency debt in total debt. At the same time, the high yields on domestic paper made borrowing in domestic currency very expensive; and it seemed all the more expensive to those who believed the exchange rate had fallen too far and was likely to bounce back. A further consideration was that exchange rate volatility – and the prospect of still further weaknesses – increased the demand for exchange rate hedges. In the event, the central bank decided to increase issuance of dollar-linked notes.

There is a similar dilemma between floating and fixed rate debt: when the yield curve steepens (as happened in Brazil), long-term borrowing becomes more expensive, and the temptation is to shorten maturities or to rely more on floating rate debt. In each case, policy-makers can react to prices (eg the exchange rate, the long-term interest rate) they believe to be significantly "wrong". If their judgement is vindicated, they can economise on financing costs.[9] But there are risks in such strategies if their expectations prove wrong (eg long-term rates rise further). As the paper by Sokoler in this volume points out, there could be the added drawback of distorting financial market reactions, which might have the effect of blurring warnings to governments about unsustainable policies.

3. Institutional investors and the bond markets

Investment by institutional investors is much smaller as a proportion of GDP in emerging markets than it is in the major industrial countries (Table 3). Because institutional investors such as insurance companies and pension funds need to hold long-dated debt, many see such institutions as key to the development of debt markets.[10] The development of funded pension schemes is likely to exert a particularly powerful influence; the accumulated funds of pension systems when fully mature will often approach an amount equivalent to the size of annual GDP. Moreover, the net demand for assets in a "young" pension fund is substantial during the process of maturation. If local bond markets are underdeveloped, institutional investors may be induced to hold short-term paper. Pension funds in some countries have an incentive to hold short-term paper either because of an inverted yield curve or because money market instruments can be traded more readily than long-term paper.

The most cited example of pension fund development in emerging markets going hand in hand with bond market development is that of Chile, which launched a funded pension system in 1981. This contributed to a long boom in Chilean asset prices, led to pension funds holding (by 2000) the equivalent of over 50% of GDP and made the Chilean capital market the most developed in Latin America.[11] The use of inflation-indexed debt was a central feature of this success. The paper by

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[9] The Brazilian real did indeed appreciate in the months that followed, appreciating by 17% against the dollar between October 2001 and March 2002: in retrospect, then, real denominated borrowing during mid–2001 proved to be much more expensive than dollar-denominated borrowing.

[10] For a good recent discussion of the policy issues raised by institutional investors see Carmichael and Pomerleano (2002). This book reviews recent studies which show that the growth of pension schemes helps financial markets to develop. See pp 108-110.

[11] At least on this measure.

Cifuentes, Desormeaux and González in this volume notes that pension fund investments in local bond markets continued to rise over a recent period when other investors were pulling out, suggesting that pension funds lend stability to the market.[12]

Table 3

Assets of institutional investors

(as a percentage to GDP)

		Insurance companies	Pension funds	Pooled investment schemes
G10 countries	(1990-97)	62.4	46.0	13.5
Emerging markets	(1990-97)	10.8	...	...
Chile	(1981)	3.1	1.2	2.6
	(1990)	6.7	24.2	3.2
	(2000)	16.7	53.8	7.7

Sources: Karacadag and Shrivastava (2000), Cifuentes et al (this volume).

The importance of institutional investors is such that rules governing portfolio decisions can raise wider issues. One problem with rules forcing institutional investors to hold a high proportion of their assets in government bonds is that they can create a "captive" market. This can undermine the creation of a true market in bonds, and in effect deter other investors.

A second issue concerns rules governing the credit quality of their investments. In order to protect investors, rules are often imposed to prevent or limit investment in non-investment grade paper.[13] Such a rule can, however, have several consequences that may undermine financial stability. It could magnify the impact of credit downgrading on a company's bonds as institutional investors are forced to sell downgraded bonds. Another possible consequence is that poorer credits could in effect be forced onto the banks, a process of adverse selection.

Another issue concerns investment in foreign securities. This is often prohibited or restricted, on the grounds that forcing institutional investors to buy domestic securities helps to deepen local financial markets. Two reservations can be raised about such reasoning. The first is that small countries typically have a greater need of diversification, and hence of investment in foreign securities. A high proportion of institutional investor assets held abroad (denominated in foreign currency) can give a country a buffer against the volatility of exchange rates. The second reservation has to do with the size of the domestic market. If pension funds are forced to put all their assets in domestic securities, they acquire ever-larger shares of often rather small domestic markets. This could create major distortions in local market functioning.

A final issue concerns the regulatory incentives or disincentives for institutional investors to trade. Long-term investors such as pension funds or insurance companies do not have the same need for liquidity as many other participants in financial markets. For this reason, they are well placed to trade by buying illiquid bonds that have become relatively cheap (so earning the liquidity premium) and selling highly liquid issues. Such activity could make bond markets as a whole more liquid. But such trading does not appear to happen in most markets. One important reason for this is apparently the absence of mark-to-market accounting. Because historic cost accounting means that losses or gains are registered only on trading, trading is often avoided for accounting reasons (eg so as not to report a loss). The experience of several countries was that banks became more active traders once they were required to mark at least parts of their portfolio to market. Institutional investors might respond in much

[12] Pension funds hold 70% of outstanding central bank and government bonds in Chile.

[13] An alternative rule might be to allow institutional investors to invest as they please, but impose higher reserve requirements or provisions against investment in riskier assets. The paper by Choy in this volume points out that this approach is applied in Peru. Another approach is to limit what institutional investors buy rather than hold.

the same way. In many countries, savings institutions (aimed at small savers) hold a significant proportion of government bonds. Some would argue that their exemption (on the grounds that they are "buy-and-hold" investors) from mark-to-market rules should be reconsidered.

4. The corporate bond market and the role of banks

4.1 The corporate bond market

With the exception of a few Asian countries, corporate bond markets have traditionally been underdeveloped in most emerging markets (Table 4). The main exception has been Korea, perhaps largely because of the size of the large chaebol. The paper by Kim and Park in this volume traces the recent history of their corporate bond market: massive issuance of three-year corporate bonds during the crisis years of 1997–98 (bonds outstanding rose above 25% of GDP); initial public interest in earning the higher yields available through the bond-type beneficiary certificates issued by the investment trust companies (ITCs); the evaporation of public confidence following the collapse of the Daewoo group in mid–1999; and then a prolonged period when various government measures to shore up demand failed to prevent massive withdrawal of funds.

Table 4

Issuers of domestic debt securities

(percentage of total, end-2000)

	Financial institutions	Central bank	Public sector	Corporate sector
Asia[1]	20	10	40	31
Latin America	26	22	32	20

[1] Simple average of Hong Kong, Korea, Malaysia and Thailand.

This experience contrasts with that of Thailand. Corporate bond issuance also rose strongly after the Asian crisis but from a much lower initial level. Moreover, liquidity has tended to improve over the years. What are the reasons for this very different performance? One possible element of an answer is that, early in the post-crisis period, the outstanding volume of corporate bonds may have been artificially driven above a sustainable level. The mechanisms of channelling household savings through ITCs may have misled households about the real risks involved. This meant that credit risks were not properly assessed. A second element mentioned in the paper by Kim and Park in this volume is the poor accounting practices of investment institutions. The maintenance of historical cost accounting contributed to the early massive flow of funds into the bond-type beneficiary certificates issued by the ITCs. The absence of mechanisms designed to protect bond investors' interests in the event of liquidation was another factor.

One implication often drawn from US experience is that a key prerequisite for the development of a corporate bond market is the existence of some form of independent credit risk assessment. For this reason – and because of the greater reliance on external assessment envisaged in the proposed new Basel Accord – most countries have reinforced efforts to develop credit ratings in their country. How successful have these efforts been? In most countries, this is very difficult to judge because the practice of the independent credit rating of corporations is still rather new. The historical record of the correspondence between default rates and credit ratings in a number of emerging economies is mixed: for example, in Korea the default rate for borrowers rated BB has been less than those rated A (see pages 141-2). One issue concerns the role of policy in fostering the development of credit rating agencies. Is it possible to reconcile the overriding need to promote objective ratings with more activist official policies (eg to promote credit rating agencies or subject their performance to official audits)?

Can independent credit rating be reconciled with provisions that allow some regulators of institutional investors to themselves determine credit ratings of the paper "their" firms can invest in?

A related issue concerns the level of corporate disclosure. In some cases, corporations may seek to evade the strict disclosure requirements for public issuance by relying on private placements. This phenomenon has been noted in India, for example, raising the issue of the governance provisions that need to be put in operation for private placements.

4.2 The role of banks

The relationship between intermediation through banks and intermediation through capital markets is controversial. Even in developed economies, two rather distinct systems have grown up – one where capital markets are very important (mainly the English-speaking countries) and one where banks dominate. In bank-dominated systems, banks were historically protected from competition from capital markets. The issuance of short-term debt that could compete with bank deposits was often limited and bond issuance by corporations was restricted.[14]

During the last decade, however, the sharpness of this dichotomy has been eroded by the development of capital markets worldwide. For many, banks can survive only if they adapt to this trend and learn to play a major role in capital markets – a conclusion reached in several international forums in the emerging markets, notably in Asia.[15] According to this view, banks need to be fully involved in bond underwriting and in the sale of capital market products to households. In addition, they will have to be able to bundle bank loans into packages to be sold in the market (securitisation). This can work best for home mortgages and consumer credits, two areas of recent strong growth in several developing Asian economies, because decisions about the pricing of such loans tend to depend not on any special knowledge or relationship, but rather on "objective" criteria (such as income, valuation of the collateralised asset and age). As this process develops, new debt instruments come on to the market.

In addition, such developments mean that prices derived from markets can be applied to the valuation of bank loans. This inevitably blurs the traditional distinction between intermediation through a bank (which typically acquires long-term non-marketable loans held on the balance sheet until maturity) and that through capital markets (where assets trade in secondary markets).

How far these trends will go in emerging markets is an open issue. At present, the securitisation of bank assets is still rather uncommon in emerging economies. This is partly because, in the current environment of weak credit demand, banks are very liquid. Nonetheless, there are also significant (and undesirable) barriers to the securitisation of bank loans in emerging markets. Some of the papers in this volume mention reforms facilitating the development of mortgage-backed securities (collateral rules; bankruptcy procedures etc).

A second question concerns the role that banks could play in developing bond markets. The view that increased bond issuance just takes away profitable business from the banks is oversimplified. First, the problem of "taking the best business" arises largely because of the regulatory framework, which can be changed. If banks are forced to hold excessive capital against loans to low-risk borrowers, this can force a migration of "good" borrowers from banks to markets that would not otherwise occur. This could represent a distortion and can be inefficient. Moreover, it could raise systemic dangers in concentrating the poorer risks on banks. The Basel Committee's proposed revision to the Capital Accord should go a considerable way to correcting such distortions. Secondly, the relationship between banks and capital markets is more symbiotic than the traditional view envisaged. The various elements of symbiosis are outlined in the paper by Hawkins in this volume.

A somewhat separate issue is whether the transition to more market-dominated bond rates has meant that the exposure of banks to unhedged interest rate risk has increased. Several papers in this volume suggest this is a nagging worry and reflects the relative lack of interest rate hedging instruments in

[14] The classic reference for comparisons of bank-based financial systems with market-based systems is Allen and Gale (2000).

[15] See in particular Yoshitomi and Shirai (2001). APEC (1999) enunciates 36 key elements for developing bond markets.

emerging markets. Another aspect concerns the application of mark-to-market discipline. Are the rules on this sufficiently rigorous? Do they ensure the proper management of interest rate risk?

5. Monetary policy and debt management

5.1 Conflicting objectives

In the simplest case where it has only one objective (price stability), the central bank sets the overnight rate (or very short-term rate) appropriate to macroeconomic conditions. It is then up to the market to determine longer-term rates without central bank intervention. Many feel it is best not to tamper with market rates which convey valuable information about market expectations and about the perceived impact of policy changes.

In others cases, however, the central bank may have additional responsibilities that require it to pursue other objectives specifically related to bond markets. For example, some central banks are responsible for the management of government debt. A debt manager normally wants to minimise the rate of interest paid on government debt, an objective that may conflict with setting interest rates needed to achieve price stability as well as leading to short-falls in sales of government debt (which causes further problems for monetary policy). This is why many countries have moved to a system for selling government securities in which the authorities set the quantity of government securities they want to sell and the market sets the price or interest rate. Such arrangements help to discipline government spending – because the government has to accept the interest rate consequences of its financing needs – and they also ensure that budget financing does not impinge on financial conditions in a way that undermines monetary policy.

Another related concern, frequently raised in the context of emerging markets, is the sensitivity of local markets to volatility in international capital markets. Several central banks have intervened directly in government bond markets when bond yields have come under strong upward pressure – often as a result of external shocks (eg in the aftermath of the 11 September attacks). One view is that preventing extreme volatility increases the underlying demand for bonds. This may be particularly true of banks, which are typically highly exposed to interest rate risk. If they can be assured that extreme volatility of bond prices can on occasion be moderated by official action, the argument runs, then they will be more willing to hold bonds. A counterview is that such action could simply featherbed the banks. This would give them less incentive to put in place proper risk management mechanisms. It could also impede the market development of hedging instruments. The balance of arguments depends on circumstances: thin or nascent markets may require more intervention.

5.2 Fostering deep and liquid government bond markets[16]

What can or should the central bank (or government) do to help develop a deep and liquid government bond market? There is no easy answer. One polar view is that the authorities need to do nothing: as issuance increases, liquidity will follow provided that trading by financial institutions is not impeded by regulation. The other view is that central banks and treasuries need to take the "necessary first steps" to get the market started – and perhaps to do so over several years. These issues, considered in more detail in the paper by Mohanty in this volume, are summarised below.

Primary markets: issuance techniques and price discovery

What can be done to improve issuance techniques and the dealership system? One strategic choice is between multiple price auctions (winners pay what they bid) and uniform price auctions (all pay the same price, that bid by the marginal winner). Some have argued that the burden of the "winner's

[16] Note that this is exhaustively analysed in the comprehensive handbook of the World Bank and the IMF (2001).

curse" (you have paid more than the cut-off price if you win) from multiple price auctions will keep investors away from auctions. This suggests that uniform price auctions will be more efficient in minimising the government's borrowing costs. But others argue that uniform price auctions in thin markets are more open to collusion among buyers. Even without collusion, uniform price auctions may not work well in thin markets where the risk of bids falling short of the amount of securities being issued is quite high. In such circumstances, debt managers may be reluctant to use a uniform-price system unless they have the discretion to set a minimum price or not allot the full amount on offer. Such hybrid auction mechanisms (for example, uniform price auctions subject to side constraints) are used in some countries.

Country experiences discussed in the paper by Mohanty in this volume do not suggest a unique pattern. Korea has recently switched from multiple price to a uniform price auction. In Mexico only fixed coupon notes are sold through uniform price auctions. India has introduced uniform price auctions for 91-day Treasury bills on an experimental basis. This diversity of experience may suggest that the type of auction system may be less important than adherence to the general principle of letting markets set prices.

Another issue is who should be allowed to participate in the auction and what role should central banks play. One view is that limiting participation in the auction to only a few dealers would restrict competition. The counterview is that allowing too many participants would increase costs and undermine the market-making role of primary dealers. The question is also whether setting up primary dealers is important to improve liquidity. For example, bond markets in Chile developed without primary dealers. In many other countries, by contrast, primary dealers are seen as playing a critical role in sustaining liquid markets. Primary dealers often help central bank understanding of the market. In addition, the two-way quotes provided by primary dealers play a significant role in developing a transparent secondary market. Bond market turnover increased significantly in several countries after primary dealers were introduced. In most countries primary dealers were extended some privileges, including the exclusive right to bid at the primary market, access to non-competitive bids, access to security-lending facilities from the central bank, or certain tax exemptions. Inviting foreign firms to become primary dealers on the same basis as domestic firms can help the transmission of best international practice in the local market.

A final dilemma is whether the central bank should directly participate in auctions. The dominant view is that direct central bank participation in ways that affect the auction result should be avoided. Indirect participation may be inevitable as the central bank replaces securities which are maturing in its portfolio; ideally, central banks should acquire such securities passively, as a non-competitive residual buyer. The paper by Reddy in this volume, however, points out reasons why central banks could intervene or acquire securities directly from the government so as to help stabilise expectations in turbulent periods.

The secondary market

There is also the question as to what central banks and debt managers should do to improve secondary market liquidity. Developing a repo market in government bonds was seen as essential for facilitating arbitrage across the yield curve and absorbing excess liquidity in the market. Yet a major shortcoming identified in this meeting was that repo markets remain underdeveloped in most emerging economies. Many papers in this volume also note that the inter-bank repo market tends to be very short-term, not usually beyond overnight. The lack of good collateral and the inclusion of repo transactions in eligible assets for reserve requirements were identified as the main factors limiting the development of repo markets. One suggestion has been that central banks should be an active player in repo markets, thus adding liquidity to securities that would otherwise be illiquid in the hands of banks.

Others have argued for an even more proactive role such as permitting market participants to take short positions in securities. Central banks could complement this effort by lending securities to primary dealers and other market players (for example, as is done by Hong Kong and Mexico) to enhance liquidity. The counterview could be that allowing short-selling may entail systemic risks by increasing leverage and creating an additional channel through which shocks can be transmitted in the financial system. There is also a concern that if central banks impose too restrictive conditions to limit such risks (for example, imposing a high "haircut" or a large interest rate premium), market participants may stay away.

A more moderate version of activism is that central banks should just "help the market find its own depth." According to this argument, central banks could be active in developing benchmarks and fostering product innovation to attract investors and encourage trading. In many cases, the fragmentation of government debt outstanding into a large number of distinct issues hinders liquidity: one symptom of this is often a very bumpy yield curve. A policy of consolidation by the central bank (that is, buying back illiquid issues and selling popular issues) can make the yield curve much smoother, and thus provide a better benchmark.[17]

Many countries have adopted such strategies in order to develop benchmarks. Singapore has recently switched to buy-back operations in order to develop benchmarks and legal changes have been introduced in Thailand to help the debt manager to buy back securities. New instruments (zero coupon bonds and "stripping") have been launched in many countries to broaden the range of instruments. In addition, developing futures market has been given emphasis in many countries. In Korea, trading in bonds received a boost after the establishment of a bond futures market. A similar trend has also been noted in Singapore. Lowering or even eliminating taxes on securities transactions have been suggested to improve trading. Nevertheless, many have argued that government bonds should not have preferential tax treatment since this would affect the "level playing field" vis à vis private issuers who may be crowded out from the market.

Many emphasise that how far these initiatives will help improve liquidity depends on the efficiency of organising and settling trades in the market. A trade execution process that leads to more competition among traders and improves the information flow to market participants should lower spreads and increase liquidity. According to this view, more open and anonymous trading should develop as electronic trading platforms take root (through either organised exchanges or the inter-broker dealer system). Greater transparency could also be achieved by publishing an issue calendar and information about post auction results. The counterview may be that in developing markets, the position of dealers may be adversely affected by a high degree of transparency, which could reduce their margins. The government may lose flexibility in addressing uncertainties if they publish an issue calendar. A final important issue concerns the payments and settlement system. It is argued that government should invest in promoting infrastructure such as an efficient depository and custodial arrangement and a robust payment system to raise investors' confidence in bond markets and lower systemic risks from securities transactions. How far central bank involvement should go is debatable.

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Recent trends in bond markets

Dubravko Mihaljek, Michela Scatigna and Agustin Villar

1. Introduction[1]

This paper reviews recent trends in the development of debt markets in the emerging economies. The paper is divided into two main parts: the first part analyses the size and growth of debt markets and the macroeconomic aspects of their development; and the second discusses the main microeconomic and institutional characteristics of emerging debt markets. The analysis in both parts focuses on domestic debt markets. The paper shows that, despite considerable growth, domestic debt markets in the emerging economies remain small compared to industrial countries – on average, equivalent to about one third of GDP. Debt issued by the public sector on average accounts for two thirds of domestic debt market volume. The main forces underlying the growth of emerging debt markets have been public sector deficits associated with fiscal adjustment and related banking and corporate sector reforms, and the need to sterilise large capital inflows associated with freer movement of capital worldwide. Efforts to develop primary government bond markets have been fairly successful, but secondary market liquidity remains poor in most emerging economies. There has been much less success in developing corporate bond markets. While banks on average hold the largest proportion of bonds in domestic markets, institutional investors have become key holders of domestic debt securities in both Latin America and central Europe.

2. Size and growth of emerging debt markets

Debt markets in the emerging economies have expanded considerably since the mid-1990s. At the end of 2000, the emerging economies covered in this note had a total of $1.9 trillion in domestic and international bonds outstanding, double the amount in 1994 (Table 1).[2] This corresponds to annual growth of 12% in US dollar terms. As a proportion of GDP, debt markets grew by 50% over this period, to 36% of the emerging economies' GDP in 2000.

Domestic bonds on average accounted for 79% and public sector bonds for 64% of bonds outstanding at the end of 2000 (Table 2). Public sector bonds issued in domestic markets remain the most widespread type of bonds in the emerging economies, followed by private sector domestic bonds and public and private sector international bonds (Graph 1).[3] The share of international bonds increased over time in Latin America and central Europe, while in Asia it remained unchanged.[4] The share of public sector bonds increased in Latin America and, to a lesser extent, in Asia, while it decreased slightly in central Europe.

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[1] Opinions expressed are those of the authors and not necessarily shared by the Bank for International Settlements. Thanks are due to Palle Andersen, Matthias Arzbach, Jacob Gyntelberg, Katarina Ott and Philip Turner for helpful comments.

[2] Statistical data in this section refer to 21 emerging market economies grouped in three regions: Asia (China, Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Thailand); Latin America (Argentina, Brazil, Chile, Colombia, Mexico, Peru); and central Europe (the Czech Republic, Hungary, Poland and Russia) plus Israel and South Africa. The starting year (1994) was chosen because data on bonds for earlier years are not available for many countries, and because it preceded the major emerging market crises of the second half of the 1990s, starting with the crisis in Mexico in 1995.

[3] By "private sector domestic bonds" are understood to mean all bonds issued by the private sector, whether held privately or traded publicly (data on the type of bonds traded are generally not available).

[4] The increase in public sector international bonds outstanding partly reflects statistical classification: Brady bonds are not included in the BIS statistics because they represent repackaged bank loans; however, when emerging economies started buying back Brady bonds and issuing in their place global bonds, these bonds were included in the BIS statistics. The amount of Brady bonds, mostly issued by Latin American borrowers, thus fell from $160 billion in 1994 to $83 billion in 2000.

Table 1

International and domestic bonds outstanding[1]

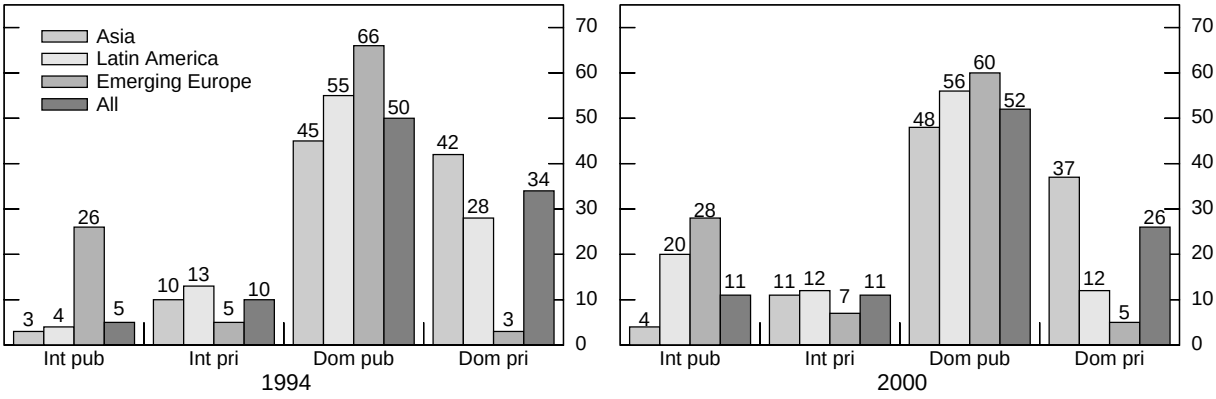
	Total		International public sector bonds		International private sector bonds		Domestic public sector bonds[2]		Domestic private sector bonds[2]	
	1994	**2000**	**1994**	**2000**	**1994**	**2000**	**1994**	**2000**	**1994**	**2000**
Asia	494	1,058	12	30	53	117	223	533	206	377
Percentage of GDP	*26*	*39*	*1*	*1*	*3*	*4*	*12*	*20*	*11*	*14*
Latin America	316	657	11	131	43	80	176	366	86	81
Percentage of GDP	*22*	*37*	*1*	*7*	*3*	*5*	*12*	*21*	*6*	*5*
Other[3]	158	179	17	34	3	8	127	124	11	12
Percentage of GDP	*24*	*24*	*3*	*5*	*0*	*1*	*19*	*17*	*2*	*2*
Total	**968**	**1,894**	**40**	**195**	**99**	**205**	**526**	**1,024**	**303**	**470**
Percentage of GDP	***24***	***36***	***1***	***4***	***2***	***4***	***13***	***20***	***7***	***9***

[1] In billions of US dollars. [2] Data on domestic bonds outstanding not available for the Philippines; breakdown between domestic public and private sector bonds not available for Thailand. Data on domestic private sector bonds not available for Poland and Russia. [3] Including central Europe, South Africa and Israel.

Sources: IMF; BIS.

Graph 1

Composition of bonds outstanding in 1994 and 2000[1]



Note: int = international; dom = domestic; pub = public sector; pri = private sector.

[1] As a percentage of the total.

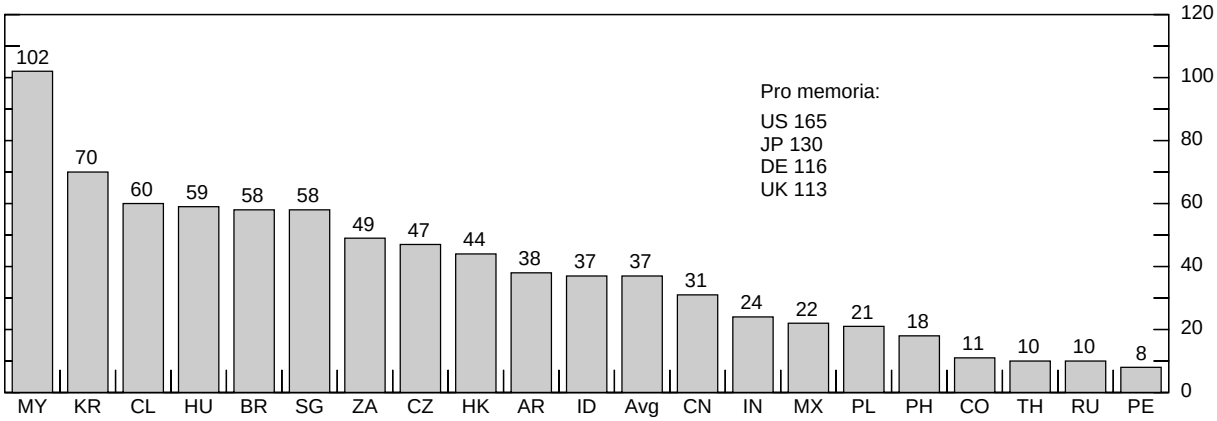
Sources: IMF; BIS.

Despite considerable growth, debt markets in emerging economies remain small compared to those in industrial countries (Graph 2). Total bonds outstanding for economies in the sample amounted on average to 37% of GDP at the end of 2000. Malaysia was the only country with total bonds outstanding greater than its GDP. Other emerging economies with relatively large debt markets included Korea, Chile, Hungary, Brazil and Singapore. Also small in size relative to those in industrial countries – on average, one third of GDP for the emerging economies in the sample – are the domestic bond markets. Malaysia and Korea are the only countries with domestic bond markets comparable in size to those in Germany and the United Kingdom. The emerging economies are lagging behind the industrial countries even more in terms of the size of the private sector debt market, which accounts for only 18% of GDP on average. Malaysia and Korea are again the only economies with private sector bond markets comparable in size to those in industrial countries.

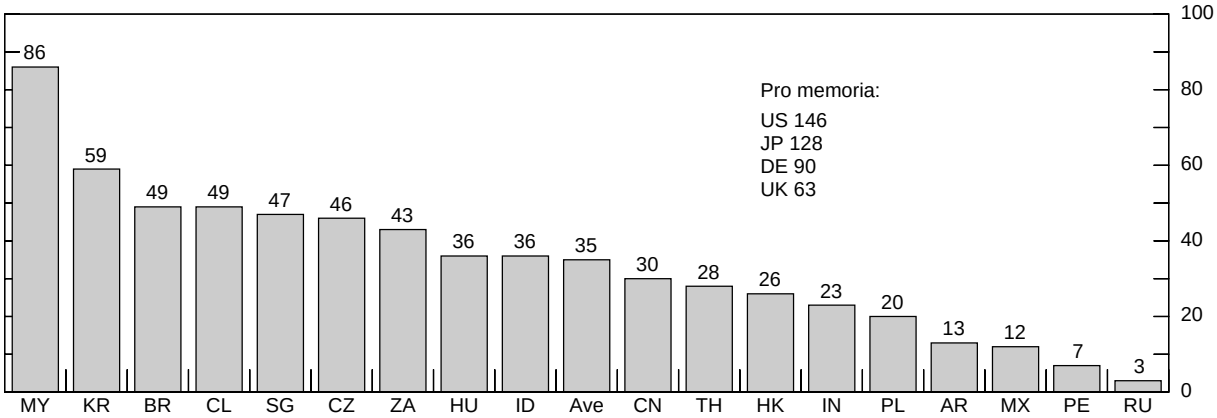
Graph 2

Amounts outstanding in 2000[1]

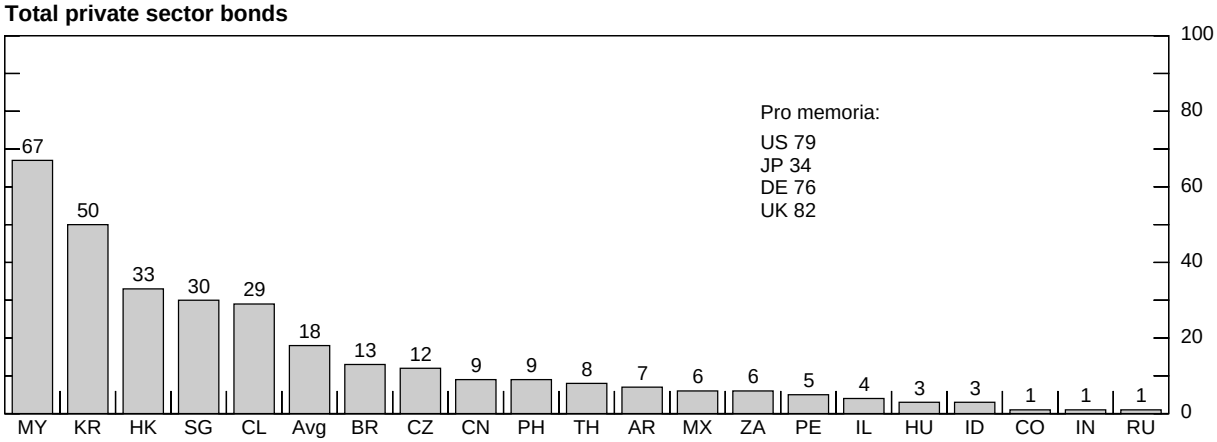
Total bonds



Domestic bonds



Total private sector bonds



[1] As a percentage of GDP.

Sources: IMF; national data; BIS.

Table 2

Structure of bonds outstanding, 1994 and 2000

(as a percentage of total)

	International bonds		Domestic bonds[1]		Public sector bonds		Private sector bonds	
	1994	**2000**	**1994**	**2000**	**1994**	**2000**	**1994**	**2000**
Asia	13	14	87	86	48	53	52	47
Latin America	17	32	83	68	59	76	41	24
Central Europe and other[2]	13	24	87	76	91	89	9	12
Total	**14**	**21**	**86**	**79**	**59**	**64**	**42**	**36**

[1] Data on domestic bonds outstanding not available for the Philippines; breakdown between domestic public and private sector bonds not available for Thailand. Data on domestic private sector bonds not available for Poland and Russia. [2] Including South Africa and Israel.

Sources: Central banks; BIS.

Further insight into the size and growth of emerging debt markets can be obtained by considering debt issuance activity. Over 1994–2000, emerging market debt issuance amounted to $2.2 trillion, on average $300 billion a year (Table 3). Latin America accounted for one half of total issuance, and Asia for the bulk of private sector issuance. Central Europe and South Africa lagged considerably behind Latin America and Asia, in particular in terms of private sector issuance. Largest issuers of bonds include Brazil (a total of $122 billion issued since 1994, of which $105 billion was in domestic markets and $38 billion in private sector issues), Malaysia, Hungary, Hong Kong and Korea (Graph 3).

Table 3

International and domestic bonds issued, 1994–2000[1]

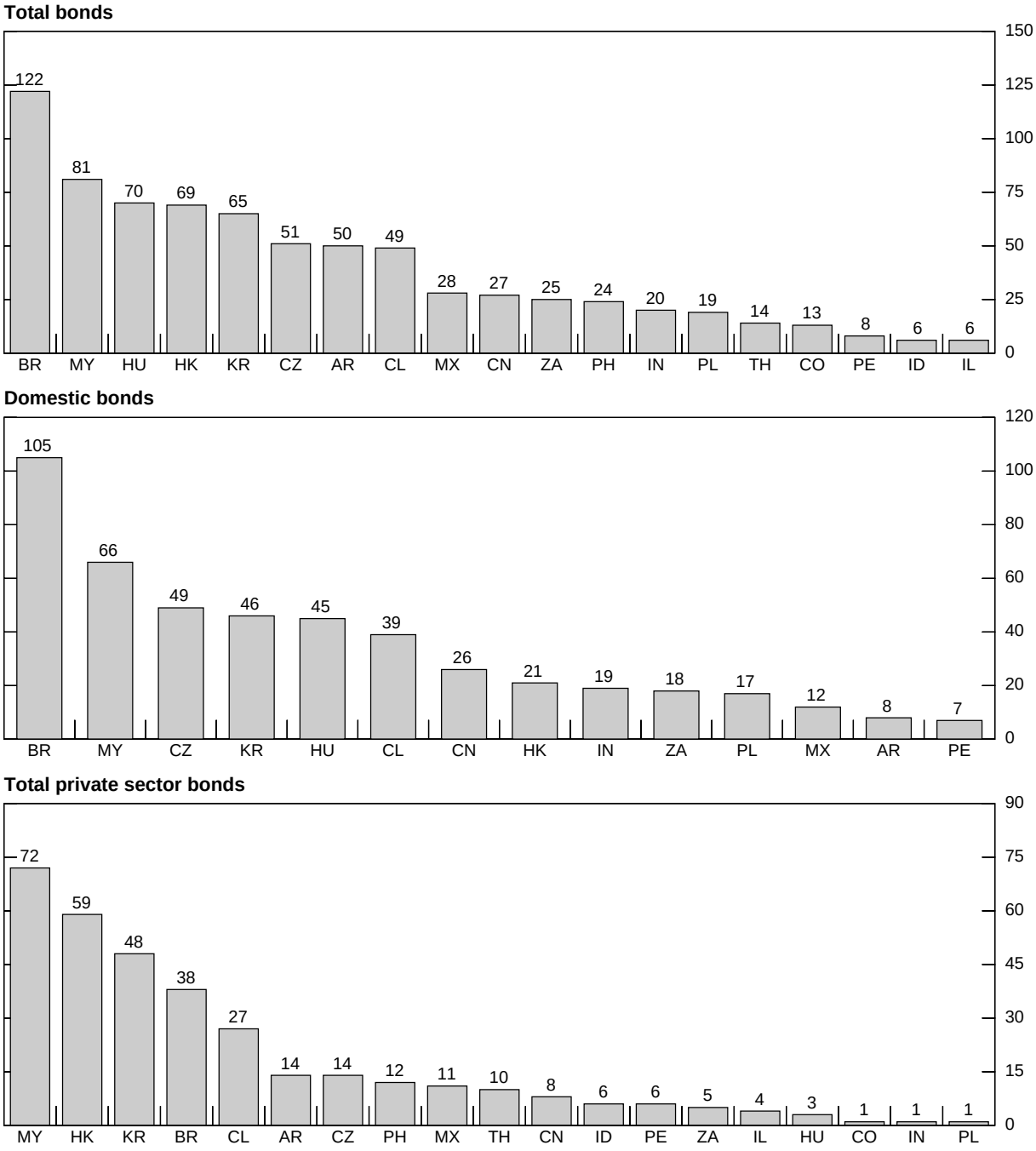
	Total issued		Total issued		International bonds		Domestic bonds		Total issued 1994–2000
	Public sector	**Private sector**	**Inter-national**	**Domestic**	**Public sector**	**Private sector**	**Public sector**	**Private sector**	
Asia	389	533	260	661	37	223	352	309	922
Percentage of total	*42*	*58*	*28*	*72*	*4*	*24*	*38*	*34*	
Latin America	734	359	345	747	173	172	561	186	1,092
Percentage of total	*67*	*33*	*32*	*68*	*16*	*16*	*51*	*17*	
Other[2]	171	19	48	141	37	11	134	7	189
Percentage of total	*90*	*10*	*26*	*74*	*20*	*6*	*71*	*4*	
Total	**1,293**	**910**	**654**	**1,549**	**247**	**407**	**1,046**	**503**	**2,203**
Percentage of total	***59***	***41***	***30***	***70***	***11***	***18***	***47***	***23***	

[1] In billions of US dollars. For international bonds, gross issuance; for domestic bonds, net issuance. Data on bond issuance not available for Colombia, Israel, Indonesia, the Philippines and Thailand. Data on domestic private sector bonds not available for Poland and Russia. [2] Central Europe and South Africa.

Sources: Data provided by central banks; BIS.

Graph 3

Cumulative bond issuance, 1994–2000[1]



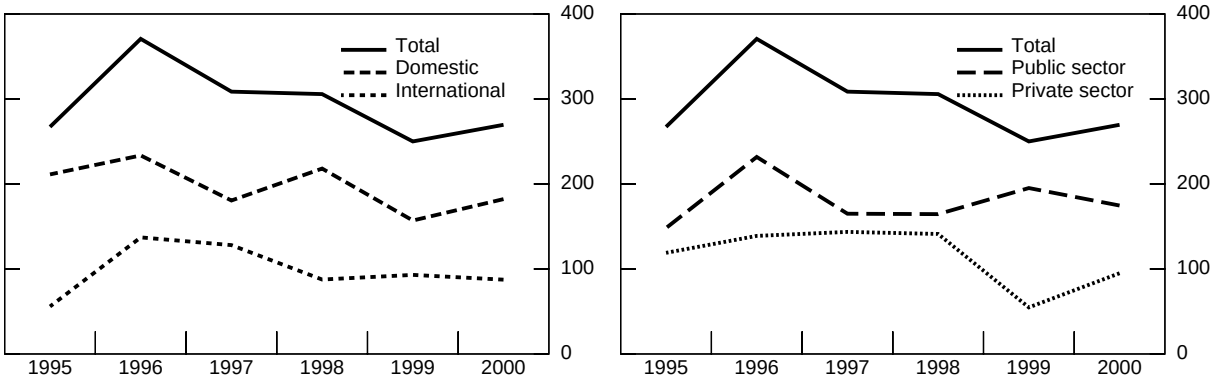
[1] As a percentage of GDP.

Sources: IMF; BIS.

Total emerging market bond issuance was roughly the same in 2000 as in 1995 (Graph 4). Annual issuance activity peaked at $370 billion in the aftermath of the Mexican crisis in 1996. Following the Asian and Russian crises it declined to a low of $250 billion in 1999. Private sector issuance declined sharply after 1998, reflecting post-crisis corporate and bank restructuring in Asia.

Graph 4

Bond issuance, 1995–2000[1]



[1] In billions of US dollars.

Sources: IMF; BIS.

3. Macroeconomic aspects of debt market development

As in industrial countries, debt markets in the emerging market economies have been changing under the influence of both endogenous and exogenous forces. Chief among endogenous forces has been development of the institutional structure and microstructure of bond markets, as well as the development of financial markets more generally. In particular, domestic and external financial liberalisation and deregulation have intensified competition among issuers, portfolio adjustments among investors, innovations by providers of financial services, and improvements in risk management practices. These developments are discussed in the next section. But perhaps even more important for overall growth of the debt markets have been the exogenous forces of fiscal adjustment, macroeconomic stabilisation, large capital inflows, and the financial market crises of 1997–98, with related banking and corporate sector reforms. The relationship between these macroeconomic factors and the size, growth and main characteristics of debt markets are discussed in this section.

It should be noted that, despite a variety of theories of debt market development, there have been relatively few rigorous empirical analyses of actual developments in emerging bond markets. The analysis that follows is an attempt to start filling this gap. But the intention is not to test the various hypotheses of bond market development advanced in the literature. Moreover, several potentially relevant issues, including the role of external financial liberalisation and foreign investors in debt market development, are considered only in passing. The focus is instead on domestic macroeconomic determinants of debt market development.

Fiscal deficits and debt markets

Based on the experience of industrial countries, in particular the United States (see Box 1), the need to finance large public sector budget deficits and the avoidance of monetary financing have generally been viewed as key macroeconomic forces underlying the development of debt markets. Several country papers in this volume also note that the social security reforms implemented during the 1990s often had the clear intention of boosting local capital market development (see the section on institutional investors).

One could expect the reliance on bond finance in the emerging economies to have become even greater during the 1990s. Most governments in emerging economies stopped monetising their deficits during the 1990s – partly as a result of greater independence of central banks and their increased

focus on price stability as the main objective of monetary policy – while the deficits themselves have declined more slowly due to ongoing structural reforms.[5]

Box 1

US experiences with the development of bond markets

Two centuries ago, the United States was a small underdeveloped country with serious financial problems. Under the 1777 Articles of Confederation, the only financial power given to the central government was the printing of paper money, the so-called "Continentals". Congress had not been granted tax powers by which it might meet appropriations or pay off borrowings and bills of credit. Instead, the funds to cover Confederation expenditures were to be obtained by requisitions on the states. But the Articles of Confederation failed to provide a mechanism to compel the states to comply with their obligation. During this period, the borrowing requirement of the Confederation was sharply increasing and Congress accumulated substantial arrears of pay owed to the soldiers of the Revolutionary Army. Although Congress had the power to borrow the funds, there was no one in America who would willingly lend to it. Many creditors, though, had no choice, and were forced to accept the Revolutionary Debt Obligations. When interest on these bonds came due, the holders had to accept *indents*, promises to pay at an uncertain time in the future, when and if the government became solvent. Speculators willing to take the chance that Congress might eventually pay off its debts fully bought up indents at a heavy discount and soon held a large part of the national debt. Besides the Treasury, many individuals were in debt as well. In 1786, the national financial system broke down completely. Further borrowing at home or abroad was almost impossible, requisitions were of almost no avail, creditors became alarmed, and when the efforts to secure unanimous consent for a national tax failed, it was agreed that, if a federated republic were to continue, the government, particularly in relation to finance and commerce, must be remodelled. This agreement paved the way for a new Constitution that became effective in March 1789.

Federal powers were greatly enhanced in the new Constitution. Congress received the power to levy and collect taxes, duties, imposts and excises, to pay the debts and provide for the common defence and general welfare of the United States, subject to the proviso that all duties, imposts, and excises shall be uniform throughout the United States. These changes at once began to bring in badly needed revenue and soon the debts of the Confederation were repaid. The government bond market prospered and attracted foreign investors. As a result, US residents were able to borrow from older and richer European countries. During the 1820s and 1830s, the United States – usually state governments – borrowed large sums from foreign investors to build roads, canals and railroads, and to recapitalise state banks. Still larger sums from overseas went into private US railway companies and other corporations. Most of this borrowing took the form of state and corporate bond sales to overseas investors. The strong public finances established by the new Constitution thus had positive spillover benefits for US state and corporate debt. Other securities markets followed, aided by the absence of restrictive regulations on the formation of corporations and, over time, generation and dissemination of standardised information.

The experience of the United States raises the question of whether governments, once they have set their public finances in order, established effective regulation for information disclosure and removed tax and other obstacles to the development of markets, need to become further involved in the development of securities markets. Some would argue rather that governments should let the markets develop on their own; the paper by Jiang et al in this volume raises a similar issue. In particular, it is not clear whether providing various incentives to firms and savers to issue or invest in long-term instruments, or requiring banks and other financial institutions to invest in government bonds, is necessary – or indeed desirable – to develop the securities markets.

Sources: Caprio and Vittas (1997); Mihaljek (1998); Sylla (1995).

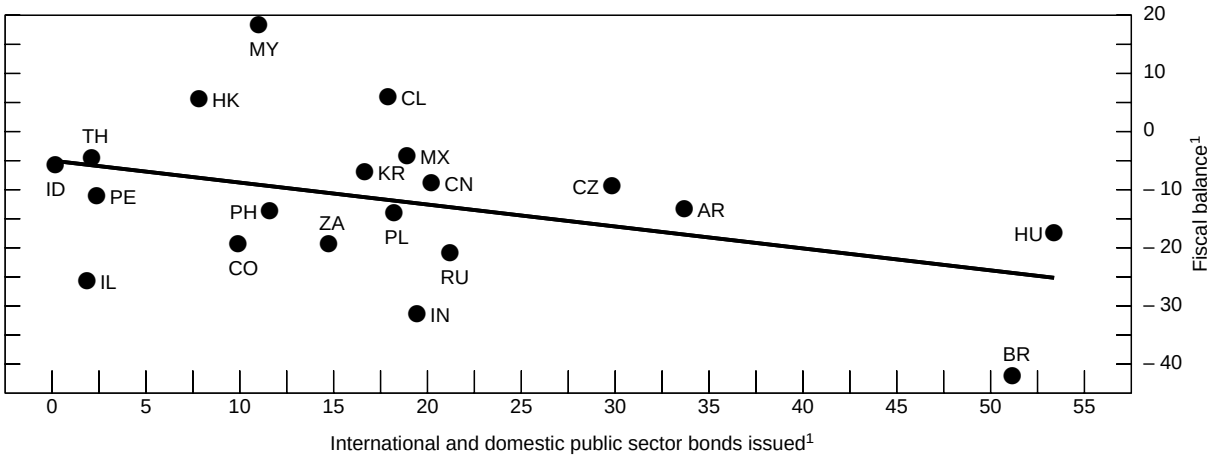
[5] The clearest evidence that the emerging economies no longer view monetisation as an option for financing public sector deficits is the observed decline in inflation: for the emerging economies in this note, average annual inflation declined from 137% during 1990–94 to 9.6% during 1995–99, and to 5% in 2000 (unweighted averages). For detailed discussion, see Mohanty and Klau (2001).

The cross-country relationship between fiscal deficits (as a percentage to GDP) accumulated since 1995 and the size of the public sector debt market confirms that countries with larger fiscal deficits have issued more public sector bonds in domestic and international markets (Graph 5). Chile, Hong Kong and Malaysia have been issuing public sector bonds primarily for the purpose of debt market development, as all three economies accumulated large public sector surpluses during 1995–2000.

Financial crises in the second half of the 1990s and the resulting need to finance very large extraordinary expenditure for bank and corporate restructuring provided another major motive for debt market development. In many emerging economies, the costs of bank restructuring alone have been estimated at more than 10% of GDP. Governments have typically financed these costs by issuing long-term government bonds in domestic markets. In Indonesia, for example, domestic debt markets took off only after the 1998 crisis, when the government issued $60 billion in bank restructuring rupiah bonds. When the data on general government balances are supplemented with the costs of bank restructuring, the estimated cross-country relationship in Graph 5 becomes much steeper.

Graph 5

Fiscal balance and size of public sector debt market

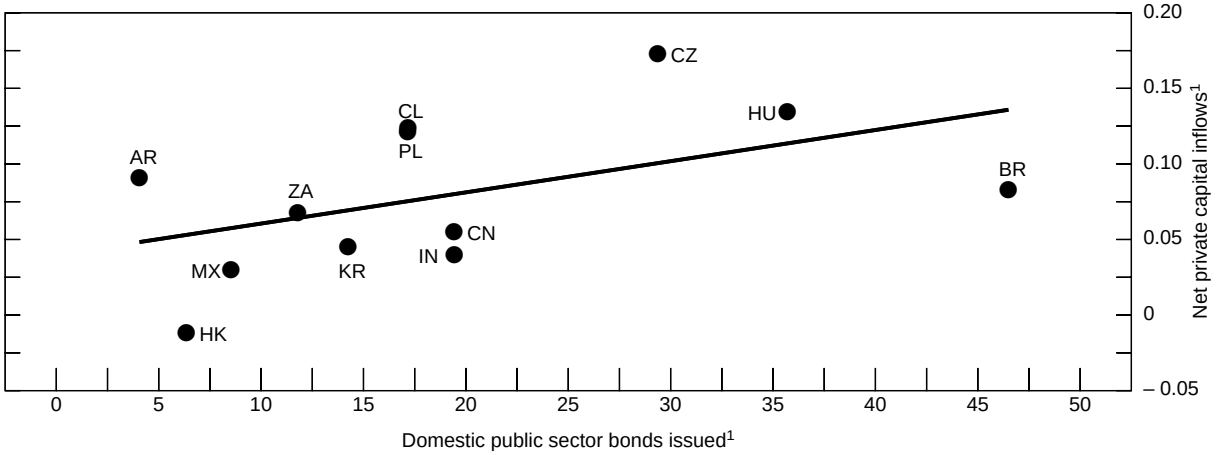


[1] As a percentage of GDP. Cumulative; calculated over the period 1995–2000.

Sources: IMF; BIS.

Graph 6

Private capital inflows and size of public sector debt market



[1] As a percentage of GDP. Cumulative; calculated over the period 1995–2000.

Sources: IMF; BIS.

Capital inflows and debt markets

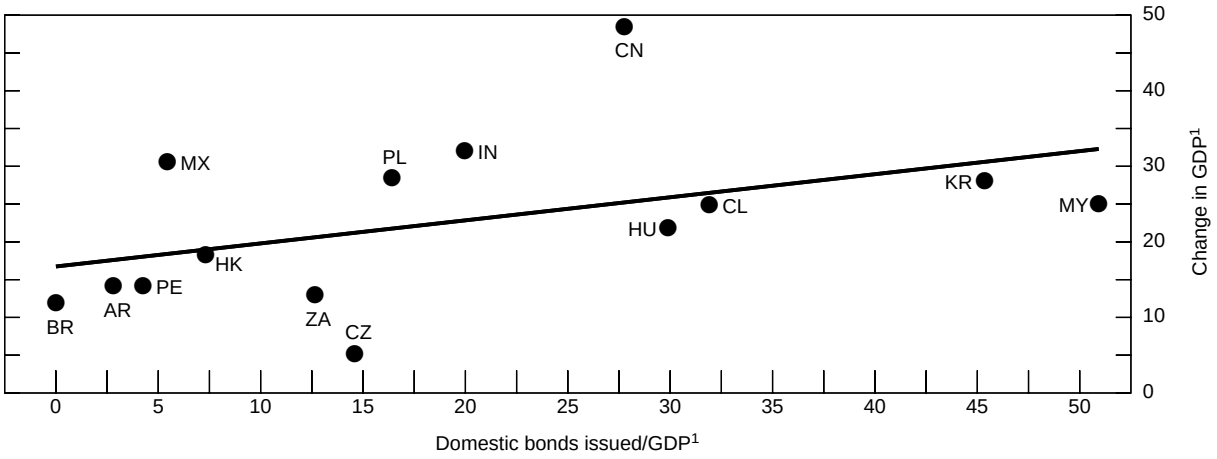
The need to sterilise large capital inflows during the 1990s, often related to privatisation programmes, provided another major motive for debt market development. In most countries, central banks were initially sterilising these inflows with their own short-term bills, but gradually most emerging economies switched to issuing longer-term government paper for this purpose. Data in Graph 6 clearly show a positive relationship between net private capital flows and the size of the public sector debt market.

Economic growth and debt markets

In addition to the motives noted above, debt markets have historically developed in response to corporate sector demand for investment finance. As they grow, many firms sooner or later approach the debt markets for additional capital with which to finance their assets. This should imply a positive cross-country relationship between real economic growth and the size of debt markets. For the emerging market economies covered in this note, such a relationship holds in the aggregate, when both private and public sector issuance in domestic markets is considered – as the emerging economies expanded their output, they also tended to rely more heavily on domestic public and private sector issuance to finance growth (Graph 7).

Graph 7

GDP growth and size of domestic debt market



[1] Cumulative; calculated over the period 1995–2000.

Sources: IMF; BIS.

When only the corporate bond market is considered, the cross-country relationship between economic growth and the size of the corporate debt market becomes much weaker. Only Korea and Malaysia stand out as high-growth countries that have developed relatively large corporate bond markets. On the other hand, companies in China, India, Mexico and Poland have been able to finance rapid growth without relying heavily on bond finance.

Strong cross-country relationship between economic growth and total size of the debt market on the one hand, and weak relationship between growth and the size of the corporate debt market on the other, imply that real growth is fairly strongly correlated with the size of *public* debt markets. One possibility – noted already in the historical experience of the United States (see Box 1) and further discussed below – could be that markets for public debt generate positive externalities for the development of other modes of financing, such as bank credit and equity financing, and thus indirectly contribute to growth.[6]

[6] There is also evidence that public and private debt issuance are highly correlated: for the countries in the sample, the coefficient of correlation between domestic public and private sector issuance during 1994–2000 is 0.5, and the coefficient of correlation between international public and private sector issuance is 0.7.

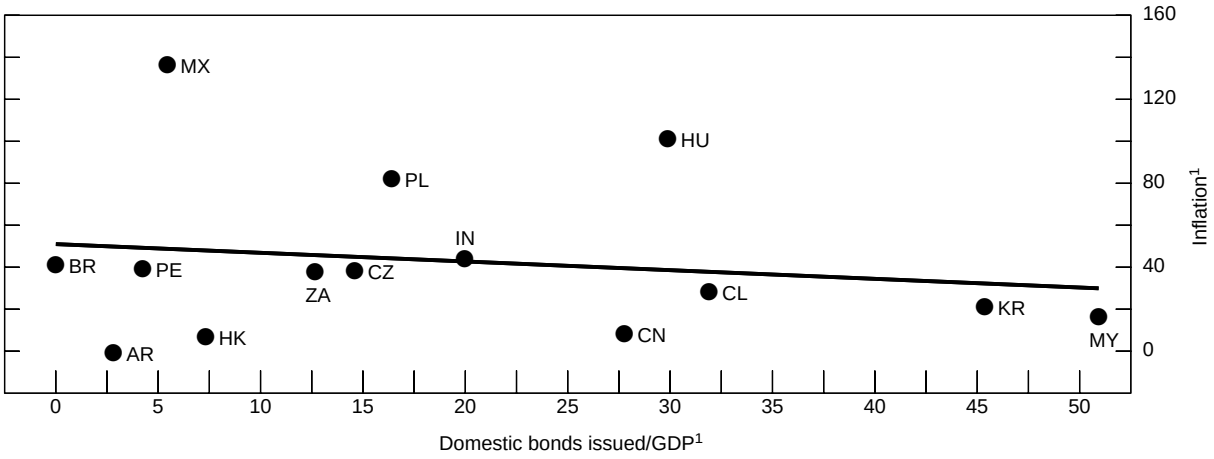
Inflation and debt markets

Low inflation has been identified in the literature as an essential precondition for the development of debt markets. Like sound public finances, low inflation is deemed to be important for creating the right incentives for investors and for facilitating the development of markets in fixed income securities.[7] High inflation and large fiscal deficits, it has been argued, distort economic behaviour in favour of short-term speculative projects and discourage the long-term investment projects conducive to sustainable economic development. A second hypothesis is that, in addition to greater reliance on the domestic bond issuance, lower inflation should also lead to smaller international bond issuance.

During 1995–2000, however, the cross-country relationship between inflation and size of the debt market appears to be weak (Graph 8). Among countries with a low cumulative increase in inflation one can find those with large domestic debt markets (Korea and Malaysia) as well as those with small debt markets relative to GDP (Argentina and Hong Kong). However, only one country with a high cumulative increase in inflation (Hungary) was able to issue a relatively large amount of bonds (about 30% of GDP) in domestic markets during this period. Regarding the second hypothesis, there is no indication that low inflation in the second half of the 1990s has led to lower issuance of international bonds by emerging economies – a line showing cross-country regression of cumulative inflation on international bonds-to-GDP ratios is flat.

Graph 8

Inflation and size of domestic debt market



[1] Cumulative; calculated over the period 1995–2000.

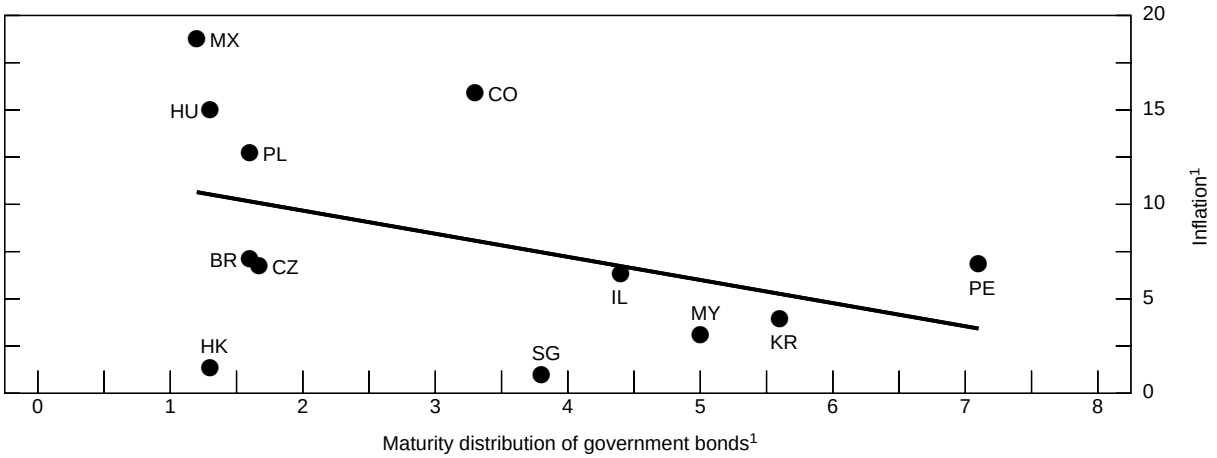
Sources: IMF; BIS.

A related question is whether low inflation has made it possible for countries to lengthen the maturity of government debt securities. This relationship seems to be more robust: when inflation performance over 1995–2000 is related to the average maturity of government bonds (Graph 9), lower inflation is associated with longer maturities. However, several countries – including Brazil, Colombia, Hungary and Mexico – have been able to lengthen the average maturity of government bonds despite relatively high inflation, indicating that other factors have also played a role in extending the maturity profile of government securities.

[7] See IMF and World Bank (2001).

Graph 9

Inflation and average maturity of government bonds



[1] Average over the period 1995–2000.

Sources: IMF; BIS.

Debt markets and alternative sources of corporate finance

The above discussion has noted the impact on bond market development of a shift from monetary to debt financing of public sector deficits. One important issue is whether bond market development has also been associated with changes in patterns of financing for the private sector. Since the Asian financial crisis it has been argued that the emerging economies should rely more on domestic debt markets so as to avoid concentrating intermediation uniquely on banks. In particular, a developed corporate bond market can help avoid a credit crunch during periods of weakness in the banking sector. Private debt markets are also expected to instil more competition into the financial system and offer longer-term financing. It has also been argued that firms may face a higher effective cost of funds in the absence of the bond market; that business investment policies may be biased in favour of short-term projects and away from entrepreneurial ventures; and that firms can expose themselves to excessive foreign exchange risks if they attempt to compensate for the lack of a domestic bond market by borrowing in international bond markets.[8]

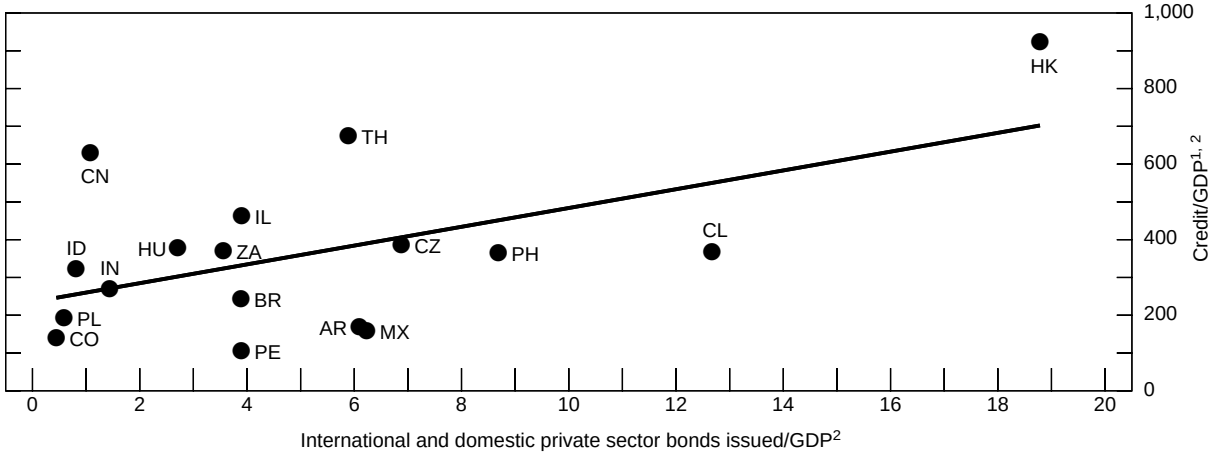
However, changing the structure of domestic borrowing towards more long-term, fixed rate, domestic currency instruments, so as to enable the private sector to hedge its currency, interest rate and maturity exposures, has proved difficult. In countries with stable macroeconomic conditions, one of the main reasons has been that banks are generally quite efficient in meeting the needs of borrowers, while savers often prefer bank deposits. The demand for finance in the emerging economies is usually very large, while the supply is limited given the low level of financial intermediation. Thus, as new channels of intermediation open up through the development of corporate debt markets, bank lending does not necessarily decline; companies that previously had limited access to bank credit can easily take up any slack left by larger corporations that have turned to bond issuance. In addition, as noted above, there may be spillover effects from the development of government bond markets on other forms of financing. These effects probably emanate from the development of the yield curve on government bonds, which helps identify the economy-wide opportunity cost of funds for investors as well as savers. These considerations partly explain why in a cross-country context the growth of private sector debt issuance and the growth of bank credit to the private sector are positively related (Graph 10).[9] The relationship is even stronger when public debt issuance is included.

[8] See Yoshitomi and Shirai (2001).

[9] The relationship in Graph 10 also holds when only *domestic* private sector issuance is considered. Korea and Malaysia are not shown because their corporate bond markets have grown much faster (by 25% and 55% of GDP, respectively) than in any other emerging economy. However, the results are similar when Korea and Malaysia are included in the sample.

Graph 10

Domestic bank credit and size of private sector debt market



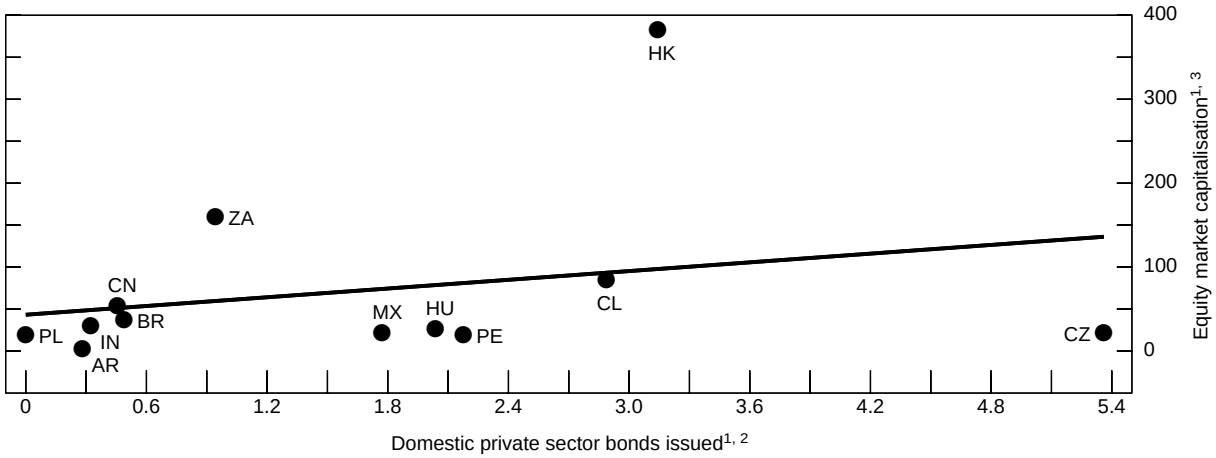
[1] Total domestic private sector bank credit. [2] Cumulative; calculated over the period 1995–2000.

Sources: IMF; BIS.

Next, the relationship between debt and equity finance is considered. It has been argued that, in environments with weak financial infrastructure, equity markets may thrive while bond markets fail to develop (see Box 2). Based on these arguments, one would not expect to observe a positive correlation between stock market capitalisation and the size of the debt market in a cross-country context. Nevertheless, such a positive relationship emerges for the countries in the sample (Graph 11). Again, this relationship may be part of positive spillover from the development of domestic debt markets on other forms of financing.

Graph 11

Equity market capitalisation and domestic private sector debt



[1] As a percentage of GDP. [2] Cumulative; calculated over the period 1995–2000. [3] End of 2000.

Sources: Standard & Poor's; BIS.

Furthermore, when spreads on international bonds and domestic equity prices are compared, the resulting correlations are in most emerging economies highly negative: a widening of the spread on sovereign bonds is usually associated with a decline in local equity prices, and vice versa (Table 4). This result should be interpreted with caution: bond spreads in domestic markets do not necessarily reflect spreads on international sovereign issues, in particular for corporate bonds, nor do spreads on international corporate bonds necessarily reflect sovereign spreads. Moreover, few companies in the

emerging economies have access to both financing alternatives.[10] Nevertheless, the absence of a single positive correlation coefficient in Table 4 indicates that financing opportunities in emerging bond and equity markets to a large extent tend to move together. These negative correlations seem to reflect the influence of idiosyncratic factors such as sentiment, perceptions of risk in specific countries, etc. Frequent co-movements of bond and equity financing in a domestic setting – as well as instances of contagion in international capital markets, which are not discussed here in detail – also raise the issue whether the bond market really constitutes an effective alternative source of corporate financing for the emerging economies; see the paper by Jiang et al in this volume.

Box 2

Why equity markets may exist where bond markets fail to thrive

What are the main obstacles to developing an efficient bond market? Why do equity markets flourish in environments with weak financial infrastructure while bond markets fail to take off? Part of the answer is inherent in the difference between debt and equity contracts. Debt claims promise repayment of principal and interest, while equity claims promise payment of a prorated share of profits and usually convey a proportionate vote in important corporate governance matters. In particular, the maximum return on a bond purchased at par value is the promised interest payments. The main challenge in pricing a bond is thus setting an interest rate that will compensate for the opportunity cost of funds, default, purchasing power and liquidity risk, as well as any idiosyncratic features the bond may have (such as a call option or a sinking fund). In environments with weak financial infrastructure these challenges are often overwhelming:

- In the absence of a secondary market in risk-free debt of a comparable maturity, it will be difficult to identify the appropriate opportunity cost of funds.
- Estimating the probability of default and the expected recovery from the liquidation or sale of the firm in the event of default will also prove difficult in the absence of credible accounting, auditing and disclosure practices, and without reliable bond ratings.
- The challenge is even greater in the absence of clear laws setting out the bondholders' rights in the event of default, when the enforcement mechanism for such rights is weak, or if the judiciary that should oversee the enforcement of creditor rights is inefficient.

In contrast to a bond, for which the upside is limited by the promised interest rate, an equity claim has an unlimited upside return, which can compensate for the perceived riskiness of the claim. Although minority shareholders will experience the same frustrations as bondholders in evaluating a firm's current condition and its earning prospects, they share an interest with the controlling shareholders and management in a rising share price. Thus, if there is an active secondary market and reliable clearing and settlement procedures for buying and selling equity claims, an active market may develop for a firm's equity even though investors would not be willing to buy its debt.

Source: Herring and Chatusripitak (2000).

[10] For a subset of countries in the sample, it was possible to calculate correlations between the spreads on selected corporate bonds (some of which are used as benchmarks) and equity prices during 1999–2001. However, the results were mixed: the correlations were negative for some countries, in line with the results observed in Table 4, but positive for others, an outcome which normally does not hold in the long run and probably represents temporary phenomena.

Table 4

Correlation between sovereign bond spreads and equity prices[1]

Argentina	Brazil	Chile	Colombia	Mexico	Peru	Russia
–0.86	–0.37	–0.79	–0.75	–0.59	–0.67	–0.53
China	**India**	**Indonesia**	**Korea**	**Malaysia**	**Philippines**	**Thailand**
–0.19	–0.50	–0.55	–0.66	–0.62	–0.86	–0.20
Czech Republic	**Hungary**	**Poland**	**Asia**	**Latin America**	**Central Europe**	**All countries**
–0.24	–0.20	–0.21	–0.74	–0.88	–0.66	–0.75

[1] Calculated over the period August 1998–October 2001; monthly averages; equity prices in national currency; bond spreads over benchmark US Treasury bonds.

Sources: Bloomberg; Datastream.

Besides the limitations of data noted above, one reason for negative correlations between bond spreads and equity prices could be any remaining foreign capital controls. To check for this possibility, correlations between yields on short-term sovereign bonds denominated in US dollars were compared with the yields on equivalent bonds denominated in local currency. The countries chosen were Argentina, which had no capital controls prior to 2002, and Hungary and Poland, which until recently had restrictions on foreign investment in short-term government bonds (Hungary lifted these restrictions in October 2001). As can be seen from Table 5, domestic and international sovereign bonds are basically perfect substitutes in the absence of capital controls (as in Argentina), but the coefficient of correlation declines sharply in the presence of such controls (as in Hungary and Poland).

Table 5

Correlation between yields on US dollar and local currency sovereign bonds[1]

Argentina	Hungary	Poland
0.91	0.29	0.49

[1] Calculated over the period January 1999–October 2001 (for Poland, August 2000–October 2001); weekly averages.

Source: Datastream.

Finally, the trade-off between international and domestic bond issuance is considered. The development of local debt markets is expected to enable governments and the private sector to reduce international bond issuance. For the sample as a whole, domestic and international bond issuances are negatively correlated (with a coefficient of correlation of –0.4). Domestic and international bond issuance are also negatively correlated when public sector and private sector securities are considered separately – the coefficient of correlation in both cases is –0.3. The development of local debt markets indeed helps reduce the reliance on international debt issuance.

4. Main characteristics of domestic debt markets

Main types of domestic debt securities

The emerging economies issue a wide array of domestic debt securities on a regular basis (Table 6). Most diversity can be found in Latin America, where floating rate, inflation-indexed, fixed rate and exchange rate linked securities are all widely represented. In Asia, central Europe and the Middle

East, fixed rate securities are most common, although Israel is an exception. The largest share of fixed rate debt is being issued in Hong Kong, Korea and Singapore. In Singapore a significant amount of other money market instruments (commercial paper, zero coupon bonds, certificates of deposits) is also issued. The proportion of fixed rate securities in Indonesia is probably underestimated, as the breakdown of domestic corporate debt by type of instrument is not available. Floating rate debt is of secondary importance in Asia while indexed debt is very rare.

Table 6

Type of domestic debt securities on issue, end-2000

(as a percentage of total)

	Floating rate	Fixed rate	Inflation-indexed	Exchange rate linked	Other
Hong Kong	29	71	0	0	–
Singapore	2	36	0	0	62[1]
Indonesia	50	0	0	7	43[2]
Korea	10	90	0	0	–
Asia	***24***	***48***	***0***	***2***	**–**
Brazil	57	15	6	22	–
Chile	1	4	89	6	–
Colombia	31	56	10	3	–
Mexico	79	6	15	0	–
Peru	1	0	13	48	38[3]
Latin America	***34***	***16***	***27***	***16***	**–**
Hungary	20	77	3	0	–
Poland	35	64	0	0	–
Israel	5	8	66	5	16[3]
Saudi Arabia	8	92	...	...	–
Central Europe and other[3]	***12***	***66***	***17***	***1***	**–**
Total sample	**22**	**40**	**15**	**6**	**–**

[1] Commercial papers and T-bills. [2] Corporate and public sector debt (other than central government debt) for which information about the type of instrument is not available. [3] Including Israel and Saudi Arabia.

Source: National data.

The share of fixed rate securities is lowest in Latin America. This is a legacy of macroeconomic instability that has resulted in large, frequent and unanticipated swings in interest rates or exchange rates in the past. Only Colombia has managed to preserve a measure of macroeconomic stability and issue a larger proportion of fixed rate bonds, although in Chile, another stable economy, almost 90% of debt is inflation-indexed. In some countries, the debt management strategies of the largest borrowers (usually governments) have aimed explicitly at raising the share of fixed rate debt. For example, Mexico increased the share of fixed rate instruments in 2001, including the issuance of 10-year bonds.

Inflation-indexed bonds are prominent in Chile and Israel. Both countries have for some time followed strategies targeting the rate of inflation. In Chile, a relatively large proportion of inflation-indexed bonds has been regarded as a sign of commitment on the part of the government to its anti-inflation strategy, as it reduces the incentives for the government to inflate its debt and thus feeds back positively into the inflation expectations of the private sector. In Israel, government debt securities have also been indexed to inflation to provide a measure of inflationary expectations. However, investors have shown a preference for fixed rate securities, so the government has issued more fixed rate bonds in recent years. The demand for floating rate securities usually comes from investors who are sensitive to interest rate swings, eg banks and investment or trust companies that finance themselves with liabilities carrying a fixed nominal value. Exchange rate linked domestic bonds are more common among Latin American issuers. Peru and Brazil maintain the largest proportion of this type of debt. In

the case of Peru, this practice is related to the high degree of dollarisation. In the case of Brazil, the motivation is less clear: it could be the backlog of previous debt management policies before the floating of the exchange rate.[11] However, during 2001, the central bank and the government increased the issuance of exchange rate linked debt to contain a sharp depreciation of the domestic currency. Chile also increased the issuance of central bank securities linked to the exchange rate in 2001, partly in response to the private sector demand for hedging instruments. Issuers in emerging markets face a trade-off: they must decide between issuing long-term bonds in foreign currency (domestically or abroad) and issuing short-term securities at home taking the interest rate risk.

Issuers and holders of domestic debt securities

Main issuers of domestic debt securities for a subset of emerging economies covered in this note for which data are available are the public sector (accounting for about one half of bonds outstanding), the corporate sector (one quarter of the total) and central banks and financial institutions (about 15% each) (Table 7). Asian economies had the largest corporate issuance. In Latin America, the proportion of bonds issued by the public sector is the same as in Asia, but financial institutions and central banks are on average larger and the corporate sector a smaller issuer of domestic debt than in Asia. The public sector is the dominant issuer in Thailand, Mexico, Poland and Israel. In Chile, the largest issuer is the central bank, which has used its paper to sterilise large capital inflows in the past. Corporate issuers account for the bulk of domestic debt issuance in Singapore, Korea, Malaysia and Peru. In Hong Kong and Korea, financial institutions seeking to comply with capital requirements by issuing subordinated debt have been prominent issuers in domestic markets.

Table 7

Issuers of domestic debt securities, end-2000[1]

	Financial institutions	Central bank	Public sector	Corporate sector
Hong Kong	64	23	5	8
Singapore	4	0	3	93
Korea	13	16	31	40
Malaysia	0	2	39	59
Thailand	1	0	83	15
Asia	***16***	***8***	***32***	***43***
Chile	27	55	4	14
Mexico	20	2	63	14
Peru	30	10	28	32
Latin America	***26***	***22***	***32***	***20***
Poland	1	14	73	12
Israel	0	16	79	5
Total sample	**14**	**15**	**47**	**24**

[1] As a percentage of total domestic debt issued in a country.

Source: National data.

The distribution of holders of domestic debt securities is shown in Table 8. Although banks on average hold the largest proportion of domestic bonds (36% of the total), institutional investors have become key holders of domestic debt securities in both Latin America and central Europe (including Israel and

[11] Because the economy is operating under a floating exchange rate, depreciation of the currency will raise the proportion of dollar-linked debt in the total.

Saudi Arabia). Other financial institutions are on average the third largest group of domestic bondholders, followed by other residents, central banks, and non-residents, who on average hold only 3% of domestic debt securities for a subset of countries shown in Table 8.

Table 8

Holders of domestic debt securities, end-2000[1]

	Central bank	Banks	Institutional investors	Other financial institutions	Non-residents	Others
Hong Kong[2]	1	65	34	–	–	–
India	7	61	19	–	–	–
Indonesia	–	96	–	4	–	–
Korea	2	63	20	14	2	–
Malaysia	7	–	–	24	1	68
Thailand	11	39	26	24	–	–
Asia	***5***	***54***	***17***	***11***	***1***	***11***
Brazil	22	30	0	49	–	–
Chile	–	31	62	7	–	–
Colombia	25	20	46	2	–	7
Mexico	–	57	13	29	1	–
Peru	3	16	43	14	–	24
Latin America	***10***	***31***	***33***	***20***	***0***	***6***
Hungary	8	23	26	2	15	23
Poland	12	34	17	26	12	–
Israel	4	16	52	7	–	20
Saudi Arabia	–	23	36	41	–	–
Central Europe and other[3]	***6***	***24***	***33***	***19***	***7***	***11***
Total sample	**7**	**36**	**28**	**17**	**3**	**9**

[1] As a percentage of total domestic debt issued in a country. [2] Data refer only to HK$ debt securities lodged with the Central Money Markets Unit at the end of September 2000, which accounts for about 70% of the total domestic debt securities outstanding. [3] Including Israel and Saudi Arabia.

Source: National data.

Institutional investors are large holders of domestic bonds in Chile, Colombia, Hong Kong, Hungary, Israel, Peru, Saudi Arabia and Thailand. In Asia, banks on average hold between two thirds and 95% of domestic debt securities (with the exception of Thailand). Other residents – which include retail investors and corporations – are significant domestic bondholders in Malaysia, Hungary, Israel and Peru. Hungary and Poland have the largest proportion of non-residents among holders of domestic bonds; they hold on average about 15% of domestic bonds outstanding.

Additional information on the structure of domestic debt holdings is provided in Table 9. The following patterns of holdings are of particular interest.

- In Asia, central banks on average hold a fairly large proportion of their own debt securities and bonds issued by the public sector. It is not clear why Asian central banks stand out in this respect compared to other emerging market regions. Furthermore, Asian commercial banks are on average the largest holders of all four types of domestic debt – securities issued by financial institutions, central bank, and the public and corporate sector – both among bondholders in Asia and compared to other regions. Asian institutional investors hold for the most part corporate bonds and debt instruments issued by financial institutions, but other investors hold on average even larger proportions of these securities. In particular, non-financial resident investors ("Others" in Table 8) have on average very large holdings of public and corporate sector bonds.

- In contrast to Asia, central banks in Latin America hold only public sector securities. Latin American commercial banks hold in their portfolios a large proportion of central bank and financial institutions' securities, and a smaller proportion of public sector and corporate bonds. As noted above, central bank securities have been widely used for sterilising capital inflows in the past. In addition, central bank paper has been regarded as a better collateral to access the liquidity facilities at the central bank, partly reflecting the 1980s experience with government debt defaults. Institutional investors hold mostly corporate and financial sector bonds. Large holdings of financial sector bonds partly reflect close association in ownership between institutional investors and banks in the region.
- Banks in other regions hold for the most part central bank bonds, and to a lesser extent public and corporate bonds. Institutional investors have on average large holdings of all four types of domestic debt securities. In some countries, institutional investors hold a large proportion of short-term central bank and financial institutions' paper because of inverted yield curves. Compared to other emerging markets, non-residents in these regions hold a relatively high proportion (on average, 10%) of public and corporate sector bonds.

Table 9

Structure of domestic debt holdings by type of securities issued[1]

	Central bank	Banks	Institutional investors	Other financial institutions	Non-residents	Others
Asia						
Debt securities issued by:						
financial institution	–	51	37	12	–	–
central bank	29	75	21	38	5	8
public sector	24	59	19	14	1	83
corporate sector	5	43	46	23	–	61
Latin America						
Debt securities issued by:						
financial institution	–	43	50	20	1	33
central bank	–	68	23	27	–	–
public sector	29	28	29	25	1	14
corporate sector	–	30	62	34	–	16
Central Europe[2]						
Debt securities issued by:						
financial institution	–	10	40	50	–	–
central bank	2	46	49	5	–	25
public sector	8	25	32	20	9	21
corporate sector	–	23	48	13	10	20
Total sample						
Debt securities issued by:						
financial institution	–	35	42	27	–	11
central bank	15	63	31	23	2	11
public sector	18	37	27	24	4	39
corporate sector	5	32	52	23	3	32

[1] Entries in this table represent the percentage of bonds issued by different issuers (financial institutions, central banks, public and corporate sector) that is on average held by different holders of domestic bonds (central banks, banks, institutional investors, etc). Because the entries represent country averages, rows and columns do not add up to 100. [2] Including Israel and Saudi Arabia.

Source: National data.

Maturity structure of domestic debt securities

The maturity structure of the stock of debt is of key importance for the development of domestic bond markets in the emerging economies. A high proportion of short-term debt tends to increase the refinancing risk and adds to macroeconomic instability. While debt stocks tend to be lower in emerging markets relative to industrial countries, average debt maturities are much shorter, making the emerging economies more vulnerable to sudden changes in financial conditions.

The proportion of short-term debt has declined for both international and domestic securities since 1995, in particular in Latin America, and it is significantly lower for international than domestic securities (Table 10). The longer maturity profile of international securities is not necessarily a source of strength: while the longer maturity profile reduces the refinancing risk, it increases the exchange rate risk, given that most international securities are denominated in foreign currency.[12] In the short-term sector of the yield curve – usually the most exploited in emerging markets – one can find both government (treasury and central bank bills) and corporate sector instruments (bills of exchange, commercial paper, certificates of deposit).[13] Short-term securities account for a larger proportion of marketable debt in emerging economies than in industrial countries because of the relatively large proportion of domestic borrowing carried out by governments in domestic markets and placed with the banks.[14] As a result, in most emerging economies debt maturity profiles are defined in domestic markets for government securities. In Latin America, central banks have also issued significant amounts of short-term paper to mop up liquidity created by capital inflows. In recent years, however, efforts directed at containing the effects of capital inflows on domestic liquidity have changed. The volatility previously experienced in interest rates has passed to the exchange rates as floating exchange rate arrangements have become prevalent in the region.

Table 10

Share of short-term debt securities

(as a percentage of total)[1]

	Domestic securities			International securities		
	1995	**1998**	**2000**	**1995**	**1998**	**2000**
Asia	19	23	22	5	7	6
Latin America	53	41	37	12	6	7
Central Europe and other[2]	15	12	15	...	...	...
Total Sample	**29**	**25**	**25**	**9**	**7**	**6**

[1] Country averages. [2] Including Israel and Saudi Arabia.

Source: National data.

Although recent issuance has lengthened the maturity profile of international and domestic debt, the share of short-term debt in Latin America and central Europe remains high compared to Asia, where the average ratio of short-term debt has remained fairly stable at around 22%. At the country level, there are considerable differences in trends: the proportion of short-term debt fell in Brazil (from 95% in 1995 to 42% in 2000) and Poland, while it rose in Chile (from 28% to 45%) and Hungary.

[12] This is sometimes referred to as “original sin”: developing countries cannot issue (long-term) international securities in their own currency. The Chilean government has been very proactive in marketing international issues of its bonds or other investment grade issuers in domestic currency. Much of this paper is in portfolios of domestic pension funds.

[13] Securities in this sector of the yield curve reach up to a maturity of two years.

[14] Countries with developed bond markets (Hong Kong, Singapore) also have higher ratios of short-term debt (about 70% and 31%, respectively) than countries with less developed financial markets.

As noted above, the debt maturity profile in emerging economies largely reflects the maturity structure of their government debt (Table 11; see also the table on page 66). Even where government securities with maturity between one and five years account for a large proportion of debt (Korea, Indonesia, Thailand), a significant proportion of these securities mature between one and two years. The long and very long part of the maturity spectrum (ie bonds with maturity of 15–30 years) is non-existent in most emerging economies. The lack of mortgage-backed securities of a meaningful size and zero coupon bonds is another noticeable gap in the product range in emerging bond markets.

Table 11

Distribution of government bonds outstanding by remaining maturity, 2000

(as a percentage of bonds outstanding)

	Less than 1 year	Between 1 and 5 years	Between 5 and 10 years	Over 10 years	Average maturity (years)
India	4	36	37	23	7.1
Hong Kong	74	20	6	0	1.2
Singapore	31	38	31	0	4.1
Indonesia	4	34	62	0	6.0
Korea[1]	20	56	18	6	3.4
Malaysia	18	52	20	10	4.7
Philippines	9	27	30	34	14.7
Thailand	15	48	37	0	...
Brazil	42	42	6	10	2.5
Chile	45	20[2]	35[3]	0	...
Colombia	30	42	20	8	3.5
Mexico	58	40	2	0	1.5
Peru	2	56	42	0	6.4
Czech Republic	79	11	10	0	1.7
Hungary	44	45	11	0	2.3
Poland	20	71	9	0	2.6
Israel	18	54	27	2	11[4]/3.6[5]
Saudi Arabia	7	34	30	29	6

[1] Distribution by original maturity. [2] Maturity between one and three years. [3] Maturity over three years. [4] International. [5] Domestic.

Source: National data.

Corporate bonds

Corporate bond markets grew strongly over the second half of the 1990s. While in Asia most of this growth took place in domestic bond markets, in Latin America issuers maintained access to international bond markets (see Table 1 above) until 1998. Asian corporate bond markets are the fastest growing, with over 60% of the domestic bonds outstanding in Malaysia and Hong Kong being corporate bonds, and Singapore's deep bond market attracting many offshore issuers, including multilateral organisations.[15] Risk diversification away from banks and the need for a different source of

[15] Earlier this year, the African Development Bank became the first supranational to issue in the Singaporean bond market.

finance for the economy have been important drivers of the process. Korea, where corporate bond issuance accounts for 45% of the market (this proportion was even larger before the recent financial restructuring of Daewoo Group), and India also have relatively large domestic corporate bond markets. In Latin America, corporations tend to issue bonds in international markets, but the rapid growth of the pension fund industry has also stimulated domestic corporate issuance in recent years. In central Europe, Israel and Saudi Arabia, domestic corporate bond markets are not well developed.

Several country papers in this volume suggest that slow growth of corporate bond markets has been due to restrictive investment regulations applying to institutional investors and financial institutions, and the lack of investment grade companies. As a result, primary placements of corporate bonds are often sporadic, usually from companies with high credit ratings, and geared towards specific segments of the market, frequently the pension funds.[16]

Corporations usually rely on underwriting or syndication to sell and distribute their securities. Underwriting may be conducted on a firm commitment basis so that the securities are effectively bought for selling on by the intermediary institution that advises the issuer. Alternatively, banks may sell bonds under a best efforts agreement for a fee. Investment banks specialise in credit analysis of securities offered and issuers. Because information gathering and dissemination have a fixed cost, it is possible for some market participants (brokers and investment banks) to specialise in bringing the securities of less frequent borrowers to the market (the more issues brought to the market, the lower the average cost). Investment bank techniques might be difficult to build up and it might be sensible to acquire them at an early stage of development of the bond market.[17]

The expansion of corporate issuance has generated a significant demand for credit analysis. Regulators have increasingly demanded more transparency and this has led to a steady rise in the number of credit ratings. Most emerging market economies are aware of the need to establish a credit rating industry and in most countries private rating agencies operate in national frameworks. The exception seems to be China, where credit rating agencies do not seem to operate. In some countries, ratings are obligatory in order to be able to offer the security publicly (eg Mexico). It is somewhat odd that in some countries ratings do not suffice for the securities to be acquired by qualified investors such as pension funds or insurance companies. Moreover, the specific regulator must approve the prospective investment. This may affect the public perception about the quality of ratings.

If credit quality is a major concern of domestic regulators, asset-backed securities have the potential to provide a significant boost to the development of the bond market. A few governments in emerging markets have been reviewing the experience of economies where mortgage-backed securities have evolved into a benchmark for domestic debt markets (eg Norway and Denmark). In emerging markets, mortgage and car loans receivable are the most common credits to be securitised.[18] Some argue that securitisation of mortgages owes much to government guarantees. In this way, the implicit subsidy granted could be taking a significant share of profitable business away from banks. This cost has to be weighed against the cost of providing liquidity and guarantees for banks' liabilities.

Trading, liquidity and marketable debt

Since the Asian crisis in 1997, trading in domestic debt rose from 25% to 44% of total trading in emerging market bonds (Table 12).[19]

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[16] See, for example, the paper prepared by Sidaoui in this volume.

[17] Many analysts argue that consolidation among international banks and brokers in industrial countries was prompted by the lower cost of expanding business through acquisition compared with the build-up of own capabilities. For a detailed analysis of the recourse to underwriting and private placement in emerging markets, see the paper by Hawkins in this volume.

[18] See the paper by Hawkins in this volume.

[19] The analysis on trading is based on figures for a subset of bonds issued by emerging economies' residents (the government or the corporate sector).

Table 12

Emerging market tradable debt: composition of turnover

(face value amounts, as a percentage of total)

	1997	2001
Brady bonds	41	16
Non-Brady bonds	23	36
Local market instruments	25	44
Debt options and warrants	6	3
Loans	5	1

Sources: EMTA (1998); EMTA (2001).

Trading in local instruments has gained share at the expense of Brady bonds, international bonds, debt options and loans. This shift reflects the increase in the stock of domestic debt instruments since 1996 (see Graph 1 on page 3), as well as the sharp drop in turnover of most bonds following the market turmoil in 1998. In particular, transaction velocity of Brady bonds fell from 16 to 8 between 1997 and 2001 (Table 13). Transaction velocity also fell for non-Brady international bonds and local securities, but this has partly reflected a sharp increase in the outstanding stocks of these bonds. It should be noted that the rise to pre-eminence of domestic debt as the most widely traded debt has not come with a degree of liquidity comparable to that achieved by foreign debt (and in particular Brady bonds).

Table 13

Emerging market tradable debt

(face value amounts, in billions of US dollars)

	1997			2001		
	Turnover	**Stock**	**Ratio**	**Turnover**	**Stock**	**Ratio**
Brady bonds	2,403	150[1]	16	573	71	8
Non-Brady bonds	1,335	249	5	1,255	421	3
Local market instruments	1,506	927	2	1,517	1,087	1
Debt options and warrants	365	–	–	102	–	–
Loans	305	40[1]	8	37	5	7
Total	**5,914**			**3,484**		

[1] 1996 figures.

Sources: EMTA (1998); EMTA (2002); Merrill Lynch (2002).

The increase in the share of domestic debt trading took place at a time when total trading in emerging debt contracted, local bond issuance rose and a wave of consolidation reduced the number of international financial institutions dealing with emerging market securities. Total trading in emerging debt securities amounted to $3.5 trillion in 2001, some 66% lower than the peak volume in 1997 (Table 14). As Russia defaulted on its domestic and part of its foreign debt in 1998, trading volumes

and issuance of international securities contracted sharply and net portfolio debt flows to the emerging economies were severely hit.[20]

Table 14

Emerging market tradable debt

(in billions of US dollars)

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Annual turnover	1,978	2,766	2,738	5,296	5,914	4,174	2,184	2,846	3,483
Debt stock	–	645	725	940	1,241	–	1,495	1,620	1,627
Ratio	–	4	4	6	5	–	1	2	2

Source: BIS calculation based on EMTA and Merrill Lynch.

Local bond issuance continued to increase after a pause in 1999, which helps explain the sustained growth in total tradable debt. The rise of domestic bond issuance in Latin America and Asia has been driven by sovereign issuance. In Asia, and to a lesser extent Latin America, governments have continued to repay international debt while issuing domestic debt. The pattern of expanding domesticmarkets is common across all regions but not across all issuers. In particular, corporate external debt has continued to grow. As a result, Latin America and Asia have increased their share of emerging market tradable debt (Table 15). Meanwhile, in central Europe equity financing has become more important and several transition economies have substantially reduced their debt in recent years, so that bond financing has declined relative to other regions.

Table 15

Emerging market tradable debt

(regional breakdown as a percentage of total)

	1997	2000	2001
Latin America	35	48	47
Asia	22	29	31
Central Europe	33	14	14
Middle East / Africa	10	9	9

Source: Merrill Lynch (2002).

Institutional investors

The growth of institutional investors, particularly pension funds, has led to a significant boost in domestic bond markets in emerging economies. As already noted, institutional investors now hold a significant share of domestic securities (Table 8). In particular, pension funds managed assets worth almost $280 billion in 2000 (12% of GDP on average for a group of countries for which data were available) (Table 16). Institutional investors have a longer investment horizon, driven by their ability to

[20] Hedge funds were not large players in emerging market debt markets and their activities seem to have been restricted to some episodes during the Asian financial crisis of 1997. However, the reduction of proprietary trading and treasury operations of large financial institutions did lead to a reduction in emerging market trading and liquidity. The drop in net portfolio flows has also been linked to the maturing of large amounts of tradable debt, so that higher repayments contributed to lower net flows.

pool investments and thus improve total return, and by virtue of holding somewhat more certain and longer-term liabilities. Because they are not subject to liquidity constraints as stringent as banks or retail investors, their investments can be channelled to assets with longer-term repayments. Although there is no clear evidence that social security reforms have increased saving rates, the rise of pension funds (and to a lesser extent insurance companies and mutual funds) is an important factor explaining the shift in the composition of saving in emerging economies towards the longer term.

Table 16

Pension fund assets under management, end-2000

	billions of US$	percentage of GDP
Argentina	20	7
Brazil	74	12
Chile	36	51
Colombia	4	4
Mexico	28	5
Peru	3	5
Latin America	**165**	**14**
Korea	55	14
Indonesia	0	0
Asia	**55**	**7**
Hungary	1	3
Poland	2	1
Israel	26	23
Saudi Arabia	30	17
Central Europe and others[1]	**59**	**11**
Total sample	**279**	**12**

[1] Including Israel and Saudi Arabia.

Sources: Salomon Smith Barney (2001); national data.

In addition to providing for the depth and breath of domestic financial markets in general, and of bond markets in particular, institutional investors are a force for change for other reasons as well. First, the development of the asset management industry brings along higher standards for investor protection, transparency and governance practices. Second, many observers regard institutional investors as a countervailing force to existing commercial and investment banks, arguing that pension funds foster competition and improve the efficiency of loans and primary securities markets. Third, institutional investors are a paramount force in promoting financial innovation and the modernisation of trading systems. It should be noted, however, that in some instances institutional investors face restrictions of an institutional or regulatory nature that may hamper their appetite for innovation.

The role of institutional investors in emerging economies varies across countries. Publicly run pension funds have, for several years, been the backbone of the social security systems in Singapore and Malaysia. In Korea, the Philippines and Thailand, pension funds do not cover a large proportion of the population, although recently there has been a shift to improve their coverage and the way they operate. In Hong Kong, the mandatory provident fund scheme began operating in 2001, while in China legislation has been passed to implement a three-tier pension system. In Poland and Hungary, pension funds have grown significantly after social security systems were reformed in the mid-1990s. In Latin America, social security reforms created many new privately run institutional investors in Argentina, Colombia, Mexico and Peru. Most of these reforms followed the model implemented successfully in Chile in the second half of the 1980s.

Several obstacles continue to hinder the development of a domestic institutional investor base. Pension funds continue to face the competition of pay-as-you-go systems. In addition, pension funds are subject to strict licensing requirements and excessive portfolio investment restrictions. While there is an obvious concern for the safety of investments, in some cases the regulation of institutional

investors seems to be geared to other objectives: in Mexico, for example, pension fund investments are restricted to government bonds. Just a handful of emerging markets keep a regulatory approach that does not distort significantly the choice of investments. Even in Chile, pension funds are required to invest at least 50% of their assets in government paper. Insurance companies are also subject to very strict portfolio investment rules that create a bias towards investing in domestic debt, but there are a few countries where "prudent man rules" schemes are in place.

The investments of pension funds are frequently biased towards domestic securities (Table 17).[21] The proportion of foreign assets in pension fund portfolios is relatively small, particularly bearing in mind that local markets for bonds and equities are a tiny proportion of world securities markets. According to one estimate, emerging bond markets account for just 6% of global bond markets.[22] Pension funds in Colombia, Chile and Peru hold the largest proportion of foreign assets.[23] Saudi Arabia is another interesting case, with foreign assets held by institutional investors dropping from 50% to 10% between 1995 and 2000.

Latin American pension funds seem to be more diversified than Asian and central European funds. Pension funds in Asia invest heavily in equity, as Asian equity markets are quite deep. But in recent years, Asian pension funds have been diversifying into private sector bonds. Pension funds in central Europe and the Middle East invest heavily in government paper.

Regulators often require institutional investors to diversify their holdings of assets out of concern for the safety of investments. In particular, diversification can reduce idiosyncratic risks. However, regulators in emerging markets have generally opted for strict quantitative limits on investments rather than a prudential approach that favours diversification and avoids risk concentration (Table 18). These limits work reasonably well when funds are young, but as their assets grow the risk of the portfolio increases because the diversification properties of the portfolio are reduced. In Chile, where the system has operated for over 20 years, pension funds have accumulated a significant share of assets in the equity market. As a result, their buying or selling decisions have a significant effect on asset valuations. To overcome this effect, the government recently increased the permitted limit on foreign asset holdings.

One approach to asset diversification is to allow institutional investors to internationalise their portfolios. Regulations in most emerging markets tend to restrict such a move. Diversification into foreign assets is forbidden in Korea, Mexico and Thailand. Other countries (eg Chile and Peru) limit investments in foreign assets or restrict investments in certain types of assets. For example, in Thailand at least 60% of assets have to be invested in government or government-guaranteed bonds, while in Colombia and Israel portfolio managers often hold only foreign assets "approved" for investment, which might effectively tilt the portfolio toward domestic assets. In Singapore, the government is seeking to encourage individuals to take a more active role in the management of their portfolios. This move should be facilitated by the differential in return between a government bond (between 2% and 4%) and alternative investments available under authorised investments.

Public sector pension funds are subject to significant political pressure. The interests of their beneficiaries might not be fully taken into account if there is a concentration of investment risk or investments are conducted on non-economic grounds. This is independent of whether pension funds are publicly or privately run. In Singapore, Malaysia and Brazil, where pension funds are run by government agencies, resources are channelled to specific assets whose rates of return are below those of other competitive assets. A recent study found that the Central Provident Fund of Singapore had a cumulative rate of return of –0.3% between 1987 and 1996.[24] In Brazil, resources from the social security trust fund are channelled through the government-owned development bank, which provides project financing at subsidised interest rates. In Malaysia, the provident fund lent money for an international airport and to a local steel maker that the government has already bailed out twice.

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[21] This is also true in many developed countries.

[22] Merrill Lynch (2001).

[23] In the case of Colombia, this is explained by the large holdings of government bonds issued in international markets and held by domestic pension funds.

[24] See World Bank, *Asia Pensions* (1998); quoted in East Asia Analytical Unit (1999), p 149.

Table 17

Structure of pension fund assets

(as a percentage of total securities holdings)

	Foreign securities	Domestic securities		
		Public sector bonds	Other bonds	Other securities
Indonesia				
1995	...	...	30	70
2000	...	...	42	58
Korea				
1995	...	2	25	73
2000	...	2	43	55
Chile				
1995	0	39	7	54
2000	11	36	6	45
Colombia				
1995	...	...	...	...
2000	23	35	18	24
Peru				
1995	...	22	31	47
2000	7	9	36	48
Hungary				
1995[1]	0	73	3	1
2000	2	66	12	18
Poland				
1995	...	...	...	...
2000	0	92	0	8
Israel[2]				
1995	0	67	3	30
2000	1	71	5	23
Saudi Arabia				
1995	50	50	...	...
2000	10	90	...	...

[1] 1998. [2] Average of pension funds.

Source: National data.

Another important issue is the way fund managers are rewarded. In most emerging market economies fund managers charged with managing institutional investors' assets are rewarded with a share of fee income from contributions. In these circumstances, fund managers tend to increase their commercial expenses, as attracting more members to their scheme increases contributions. In Chile, Argentina and Mexico, expenses incurred in marketing are a significant share of fund managers' total operating costs. A performance-related compensation scheme, together with greater freedom in the choice of the optimal investment portfolio, might help profitability and financial strength. In Singapore, the government has started to farm out some portfolios of the central provident fund so as to improve investment performance. Fund managers' fees are tied to investment performance, which provides an incentive for better credit analysis and greater efficiency.

Table 18

Investment limits applying to pension funds

Asia		
China	Institutional investors can hold bonds denominated in foreign currency or issued by foreign tenders.	
India	Non-government provident funds can hold:	
	• Central government securities (including limits on 100% Gilt Mutual Funds): up to 25%	
	• Provincial government securities and central provincial government guaranteed securities: up to 15%	
	• Public sector bonds and CDs issued by public sector banks: up to 40%	
	• None of the above three categories: up to 20%	
Hong Kong	Limits in terms of types, currency and original or remaining term to maturity of assets.	
Indonesia	Bonds: 20% (except for government bonds)	
	Corporate bonds: 10%	
	Equity: 10%	
Korea	Investments in sub-investment grade bonds not allowed.	
	Acquisition of securities issued by non-residents in local currency with a maturity shorter than one year must be approved by the central bank.	
Thailand	Investments in foreign assets are not allowed.	
	At least 60% of assets in T-bills, government bonds and bonds issued by a state-owned enterprise and guaranteed by the government.	
	No more than 40% in other securities.	
Latin America		
Chile	Limits in terms of investments in foreign assets and credit risk.	
Colombia	Public sector:	MBS: 40%
	Treasury: 50%	ABS: 20%
	Central bank: no limit	Corporate bonds issued by:
	Deposit insurance: 10%	financial institutions: 30%
		others: 30%
		Sight deposits: 2%
		Foreign fixed income: 10%
Mexico	Investments in foreign assets are not allowed.	
Peru	Up to 7.5% in foreign securities rated as investment grade.	
Emerging Europe		
Hungary	Investments in foreign assets: 30%. Investments in non-OECD countries: 20% of the previous limit.	
Poland	Investments in:	
	foreign assets: up to 5%	
	bank deposits: up to 20%	
	equity: up to 40%	
	mortgage letters: up to 30%	
	Treasury and central bank: no limits	
Middle East		
Israel[1]	Provident funds: at least 50% in government bonds or corporate bonds with at least Aa rating or deposits with a bank with a credit rating of at least Aa.	

[1] Funds of individuals near to retirement: 93% in government bonds. Funds of young contributors: 70% in government bonds.

Source: National data.

Other aspects of domestic bond markets

Bonds in emerging economies are generally traded in the over-the-counter market supported by dealers and brokers. This is mainly due to the diversity of characteristics of bonds traded (coupon, maturity, sinking fund, fixed or floating rate, etc) and calls for some degree of specialisation. As from the mid-1990s, inter-dealer screens have offered the bond market a number of advantages, including facilitating swifter and more accurate trading, and the anonymous conduct of large-scale business.

However, in emerging markets inter-dealer screens are not well developed and sometimes pose a risk for the development of the markets because of the lack of infrastructure. In particular, the successful completion of trades is highly dependent on the development of payment and settlement systems, centralised depository institutions, and efficient clearing systems for securities. For these reasons, several central banks have taken a proactive approach in developing market infrastructure and institutions. The experience of more developed economies shows a similar development path for the market, but central banks gradually withdrew from this role once the market gained maturity. Stock exchanges have kept a significant share of corporate bond trading in Poland, Malaysia and Korea, although over-the-counter trading in Korea is also permitted.

The efficient pricing of risk and liquidity are directly linked to the sound functioning of secondary markets. Cash, repo and forward markets most often develop with the deepening of the market and the increase in liquidity.[25] This has led some policymakers to emphasise a level playing field for the development of the bond markets. Central bank intervention, particularly in price setting, is generally deemed undesirable, as it could confuse the market about the central bank's true intentions. It is important to recognise that the liquidity of a market depends on several factors, some of them cascading from the primary markets, and that central banks should focus on daily liquidity management operations to smooth fluctuations in key money market rates. The pre-eminent role of governments as issuers may allow them to play a significant role. It is very often the case that the short term of the yield curve is crowded with a large number of issues from different issuers, occasionally in amounts that exceed the underlying demand. The governments should therefore consider leaving this part of the market to the corporate sector. In Poland, for example, the share of short-term government issues has halved since the mid-1990s.

There are other factors that help boost liquidity in bond markets. A diversified and heterogeneous investor base enhances market liquidity. Diversity of investment horizons, risk tolerance levels, and investment objectives among investors provides opportunities for trading, while larger flows help with the efficiency of pricing. The benefits of diversification of the investor base could be achieved through indirect means. The development of the fund management industry could help channel retail investors to the bond markets, notwithstanding the use of retail schemes in primary markets, as the latter generally make available a limited set of government securities and do not help in expanding the investor base for other fixed income instruments.

Two long-standing difficulties for the trading of bonds in emerging economies are clearing systems and central depository institutions. Poor clearing systems tend to hamper trading as transactions are settled on a bilateral basis among market participants. In this way, trading credit lines are quickly exhausted unless clearing and settlement takes place on a continuous basis. Furthermore, systemic risk issues may arise when clearing and settlement systems are poorly run. In Chile, the central bank is revamping the clearing and payment system infrastructure to reduce inefficiency and pyramiding of risks. In Brazil, the payment system is undergoing a radical change that will improve risk management and reduce the pyramiding of risk on the central bank. In central and eastern Europe, central depositories were built from scratch and are operating with high levels of efficiency. It has been more difficult to reform systems already in place to catch up with new developments. In Korea, the attempts to introduce securities registries for corporate bonds have been held back by vested interests.

The lack of efforts to foster the development of repo markets in emerging economies is in sharp contrast to the efforts undertaken to reform primary markets. Several emerging economies have repo markets but they are dominated by trading between the central bank and financial institutions rather than between financial market participants, even though repo operations are a cost-effective means to finance bond portfolios and hedging. In other cases, lack of good collateral has been identified as one of the main factors adversely affecting their development. No significant repo market exists in central Europe. In the Czech Republic, the size of the market is the main obstacle, while in Poland there is competition from an incipient commercial paper market and additional settlement charges are imposed on repo transactions. In Korea, a failed experiment in 1998 and withholding taxes discouraged the repo market until recently. Partly as a result, Korea has seen a worsening in secondary market

[25] Repo stands for sale and repurchase agreement, a money market financial transaction structured as a contractual agreement for the sale of a security today and the purchase of the same security in the near future, most generally up to a year. In developed financial markets many observers regard repos as risk-free credit. There are three types of repos: classical repo, sell/buyback and securities lending.

conditions despite a large increase in issuance. While repos are the most widely used instrument in money markets, they are not the only one. In Hong Kong, a liquid market in bills and notes is at the centre of the money markets.

Another important element for the development of secondary markets is the amount of capital committed to trading activities by dealers and brokers. The trading volume is directly related to the capital base of the trading business, and there is evidence that severe shocks tend to reduce the risk capital base of banks in developed economies. In the presence of a major shock, there may be a sharp increase in trading activity at the same time that risk capital decreases and a contraction of credit takes place. This may result in wider variations of prices or could even cause a market disruption. One way of providing a wider capital base is to involve internationally diversified financial institutions that may face less severe constraints in their provision of capital in response to adverse domestic developments.[26]

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[26] This might depend on the nature of the shock.

Bond markets and banks in emerging economies

John Hawkins[1]

1. Introduction

As the financial system in most emerging economies is centred on banks, an important aspect of the development of bond markets is the impact on the banking system. One frequently heard worry is that bond markets could take business away from the banks. This raises some potential concerns for bank supervisors. On the other hand, if it means firms are less vulnerable to weaknesses in the banking system, corporate bond issuance can help central banks achieve steady economic growth. Banks also play an important role in developing a private sector bond market as they are often among the most important issuers, holders, dealers, advisers, underwriters, guarantors, trustees, custodians and registrars in this market. Indeed, banks are deriving more of their profits from such activities and less from lending. For this reason, it is important to have healthy banks to have a sound bond market. And a bond market may improve the health of banks, by improving market discipline.

2. Competition between banks and bond markets

2.1 The historical development of banking and bond markets

At early stages of development, corporate bond markets are not generally an alternative to the banking system. The general pattern observed in advanced economies has been for banking to emerge at a much earlier stage of development than bond markets. In the United States, where the corporate bond market is most developed, bond market financing overtook borrowing from domestic banks long ago. In western Europe it has been much slower to develop. Among emerging economies, the corporate bond market is largest in Korea (in terms of amounts outstanding, although much of this is little traded). Notwithstanding a major setback following the 1997 crisis, this has been the major source of funding for corporations there since the early 1990s. Bonds have been increasingly supplementing bank lending as a source of finance for the private sector in other emerging economies as well (Table 1).

In cross-economy comparisons (such as the graphs on pages 43 and 95 of this volume), it is notable that both banking and bond markets tend to be larger, relative to GDP, in rich countries,[2] although even some rich countries still have small bond markets. As economies mature, banking markets tend to become developed before bond markets. Yoshitomi and Shirai (2001) and Shirai (2001) suggest several reasons for this: in poor countries, individuals have a greater preference for liquid short-term bank deposits; institutional investors are underdeveloped or non-existent; few companies are sufficiently large and reputable to issue bonds; and the requisite informational, legal and judicial infrastructure is not in place.

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[1] Opinions expressed are those of the author and not necessarily shared by the Bank for International Settlements. Thanks are due to Bill Coen, Craig Furfine, Elmar Koch, Jochen Metzger, Madhu Mohanty, Uwe Neumann, Shirai Sayuri, Peter Stebbing and Philip Turner for helpful comments. Michela Scatigna prepared the tables.

[2] China is a special case as under the socialist market economy banks are prevalent but only recently has a private corporate bond market developed. Along with its high rate of saving, this has led to bank deposits being large relative to GDP for an economy at China's income level.

Table 1

Domestic finance to the private sector

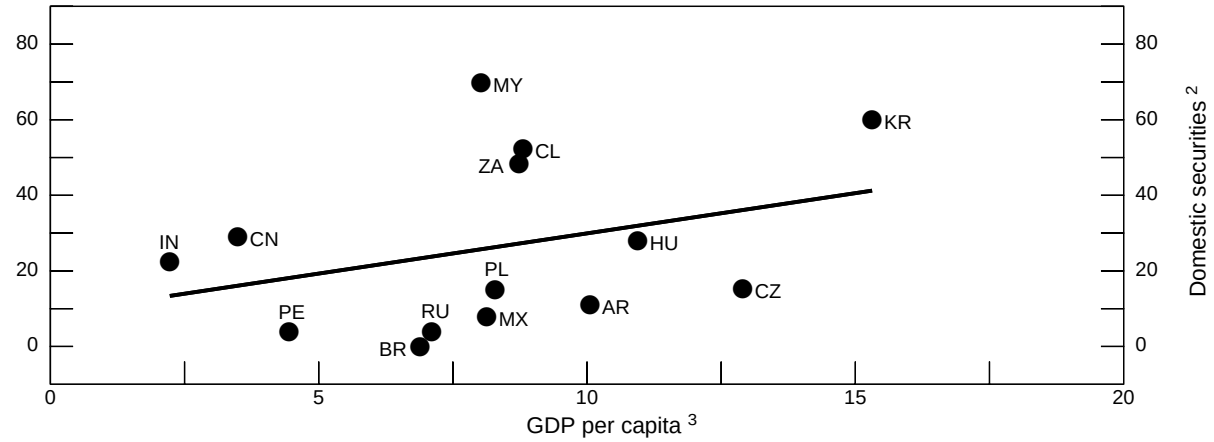
Ratio of domestic bank lending to sum of domestic bank lending and private sector domestic debt securities on issue (end-year)

	1990	1995	1998	2000
East Asia[1]	0.85	0.82	0.84	0.85
Latin America[2]	0.97	0.81	0.77	0.83

[1] China, Hong Kong, India, Korea, Malaysia and Singapore. [2] Argentina, Brazil, Chile, Mexico and Peru.

Sources: BIS; IMF.

Graph 1 **Size of domestic securities markets[1]**



[1] Average over the period 1999-2000. [2] As a percentage of GDP. [3] In thousand of US dollars (PPP adjusted).

Sources: IMF; World Bank; BIS.

2.2 Do bond markets substitute for bank lending?

A much cited simile coined by Alan Greenspan (2000) is that bond markets can act like a "spare tyre", substituting for bank lending as a source of corporate funding at times when banks' balance sheets are weak and banks are rationing credit. This was the case in the early 1990s in the United States, and there were some signs of it in Hong Kong in the late 1990s, when domestic banks adopted a conservative lending stance as property prices collapsed.[3] Conversely, banks may substitute as a source of funds when bond markets dry up, as occurred following the Russian default in 1998.

An alternative view is that bond markets rarely fulfil this "spare tyre" role. When banks are reluctant to lend, it is usually a reflection of a general loss of confidence in the economy. At such times, it is also hard to place corporate paper; indeed, as bondholders generally know the lending parties less well than do bankers, this form of finance may be even more likely to dry up in adverse times.

An empirical test conducted by Jiang et al (2001) finds that bond issuance and bank lending are usually positively correlated, in both OECD and emerging economies. An alternative approach, which focuses exclusively on periods of *weak* bank lending, is given in Table 2. It suggests that bond markets more often provide some offset to cutbacks in bank lending, although in most cases only a very partial offset. (A cautionary note with such studies is that if banks' non-performing assets are

[3] Retained earnings and equity raisings are other important sources of corporate funding.

being transferred to an asset management corporation funding itself by issuing bonds classified as private sector, this could generate a spurious inverse correlation between bank loans outstanding and bonds on issue.)

Table 2

Corporate bond funding at times of weak bank lending

(change as a percentage of initial domestic credit outstanding)

		Domestic bank credit	Corporate bonds
United States	(1990-93)	1	13
Sweden	(1991-93)	– 38	– 27
Hong Kong	(1997-99)	– 16	1
Singapore	(1997-99)	– 16	1
Argentina	(1998-2000)	– 7	1
Mexico	(1998-2000)	– 8	8
Czech Republic	(1997-2000)	– 26	4

Sources: BIS, IMF, central banks.

Over the longer term, the development of bond markets may have slowed the growth of banks but it does not appear to have caused their business to contract. Of 25 major emerging economies the domestic corporate bond market was larger (relative to GDP) in 2000 than in 1995 in all but India and Brazil. But over the same period, bank lending only contracted appreciably in five economies, and in these cases the contraction was more a reflection of banking crises than displacement by strong growth in bonds. There have been reports in Thailand and Hungary of many new bond issues being used to repay existing bank loans rather than to fund new projects, but this still appears to be the exception.

2.3 Do bond markets take good lending business away from banks?

Highly rated companies issue more bonds than do lower-rated companies. In general, rated issues are rated at least A, although there are many unrated issues.[4] This is unlikely to change; of the advanced economies only in the United States is there a well developed market for lower-rated ("junk") bonds. One reason is that many investors are confident about buying securities issued by "blue chip" companies but feel it is hard to evaluate the credit-worthiness of less familiar companies. In some countries (eg Malaysia), this reflects policy decisions; in order to ensure the corporate bond market develops at a measured pace, initially only high-rated companies were allowed to issue bonds, with the cutoff rating gradually being lowered.

The prevalence of higher-rated bonds may partly be due to regulatory distortions. One factor is that pension funds and the like are often only permitted to buy investment grade paper. Furthermore, capital requirements do not distinguish between different corporate risks. For companies with a high rating, particularly if they are rated better than the bank itself, issuing corporate paper looks attractive. This raises the issue of whether the quality of banks' loan books will deteriorate as they lose better borrowers (one reason why some countries have tried to slow the development of the corporate bond market). This in turn may drive banks to lower their credit standards.

[4] In Korea the majority of corporate bond issues are now rated below A, but were probably rated A or better when they were issued.

Views differ about the extent to which bond markets will reduce banks' business. Large companies are likely to retain a relationship with banks but the nature of that relationship will change. One senior supervisor suggested that reputable large companies will still borrow from banks for many purposes such as working capital and good small companies will still rely on banks for funding. Good companies will also deal with banks because of banks' role at the centre of the payment system. Firms may also want to keep credit lines with banks and maintain relationships with them to ensure support in troubled times when securities may be hard to issue, or hard to issue cheaply or quickly. A bank loan is easier to restructure than a bond issue. Some companies may prefer to deal with a bank confidentially rather than face the disclosure requirements of bond financing.

Supervisors may become nervous if the quality of bank loans drops. In principle, lower-quality loans are not necessarily problematic provided that they are appropriately priced and provisioned, and adequate capital is held. However, this may not be the case. The task of risk management becomes harder as loans become riskier, and not all banks may do it well.

Issuance of bonds by companies, giving them more stable longer-term funding, may improve the quality of remaining loans to them by banks. On the other hand, if companies use bond issuance to raise their overall debt-equity ratios above prudent levels, it may worsen the quality of bank loans. One central banker pointed to a possible conflict if the authorities appear to be simultaneously wanting banks to cut back lending to a sector but also to be encouraging the sector to borrow through the issue of bonds.

2.4 Do bonds take deposits away from banks?

As bond markets develop, banks may lose the deposits of wealthy customers who seek to earn higher returns on at least a portion of their portfolio. The main type of bank deposit with which corporate bonds may compete is the negotiable certificate of deposit. The issue of certificates of deposit gives the bank secure funding for their typically three to 12-month maturity, and should give the holder a liquid instrument (although in many emerging economies they may not be very liquid in practice). However, some of the funds put into domestic bonds may have previously been invested in foreign bonds rather than in domestic banks. It can be argued that banks are favoured over bond markets by the authorities, due to the provision of explicit or implicit deposit insurance.

Indirectly, the development of the bond market may reduce demand for bank deposits by stimulating the growth of the funds management industry. This may particularly be the case when banks pay no or very low interest on many accounts.

3. Banks as users of bond markets

3.1 Banks as purchasers of bonds

In some economies, banks are major holders of corporate bonds. For example, in Indonesia banks hold the majority of corporate bonds, and this used to be the case in Argentina, Brazil, Chile and Malaysia as well. Banks may hold a smaller proportion over time as institutional investors such as pension funds develop. In some cases (eg Malaysia - but with some exceptions related to corporate restructuring), banks are only allowed to hold investment grade (BBB or better) bonds.

When bonds (government as well as corporate) form a significant proportion of banks' balance sheets, as in India, the question of their valuation becomes significant. With financial systems becoming largely market-based, there have been increasing requirements for bonds to be marked to market, making their apparent value more volatile. In some cases, the same bond may be marked to market if regarded as part of a trading portfolio but valued at cost if held as a long-term investment (and in many emerging economies banks often hold bonds to maturity).

As well as purchasing bonds for themselves, banks often manage investment and pension funds that may be significant purchasers. If the bank is also a lender to the company issuing the bonds, it would have an information advantage in assessing the bonds, but this could give rise to concerns about its fiduciary responsibilities to fund investors and even "insider trading". A conflict of interest could arise if a fund managed by a bank buys bonds issued by a troubled firm which uses the proceeds to repay a

loan from the bank. A challenge for supervisors is to ensure there are effective firewalls within organisations to prevent such conflicts. Having securities business conducted by a distinct subsidiary of the bank, or placing banking and securities business in sister subsidiaries under a holding company, may help in this.

3.2 Banks as issuers of bonds

Banks use bond markets to supplement deposits as a source of funds. Indeed, in many cases (eg Brazil, China, Germany, India, Indonesia, Mexico, Poland, Russia and Thailand) banks and other financial institutions account for most domestic bond issuance. Subordinated bond issuance has the advantage for banks of being recognised as Tier 2 capital. It also has the potential virtue of making banks more subject to market discipline.[5] Banks specialising in longer-term lending will tend to issue long-term bonds to lock in funding.

3.3 Banks as securitisers

Where bond markets have been developed, banks may be able to use them to sell off some of their loans. This may enable banks to economise on capital, reduce maturity mismatches, enhance their liquidity and diversify (geographically or sectorally) their credit exposures. Often such "securitisation" is done by parcelling up loans and selling them to a special purpose vehicle which then issues securities backed by the loans and their underlying collateral. This raises the question of the subsequent role of the banks with respect to these loans. Purchasers may wish the banks to continue the administrative role of collecting interest payments. While securitisation contracts may require banks to chase overdue payments, banks may have less incentive to chase delinquent borrowers after they have sold the loans. They may even have much less incentive for careful credit assessment if they intend to sell off the loans soon after they are made.

However, concern about reputation provides some such incentives if the banks wish to use securitisation regularly. Furthermore, in practice, securitisation is structured to reinforce these incentives. Purchasers only buy a partial share of the loans or require the issuer of the securities to overcollateralise them. A more sophisticated version of this is where the securities based on the loans are divided into tranches, with the upper tranches (paying a lower interest rate) having first call on repayments.

An alternative approach to this problem is requiring the banks to guarantee full and timely repayment of loans sold ("securitisation with recourse"). This means that although the loan itself is no longer on the balance sheet, there is still a contingent credit exposure, as the final credit risk remains with the bank. Supervisors will therefore insist that capital is held against such exposures (see BCBS (2001)), thus partly defeating the purpose of the securitisation. A more subtle problem arises when a bank is under no legal obligation to guarantee repayment of securitised loans but nonetheless feels an obligation to avoid reputational risk ("implicit or moral recourse"). This is particularly likely for banks making extensive use of securitisation.

Another possible consequence of securitisation is that, as only the best-quality loans may be suitable, it may weaken the average quality of banks' balance sheets. Whether this should unduly concern supervisors is discussed above.

Securitisation has only occurred in recent years in most emerging economies and is still not practised in many. One reason is cyclical; in many economies banks are currently very liquid and there are not many good lending opportunities (and as economies head into recession, banks may prefer to keep their better loans on their own books). Securitisation seems to be done more by foreign than domestic banks. It is relatively advanced in Korea, where there are more products with more complicated structures. In some economies a special case of securitisation – asset management corporations

[5] Subordinated debt could generate a better market estimate of bank risk than do equity prices at present. While a simultaneous increase in risk and expected return could either raise or lower the share price, it should unambiguously lower the price of subordinated debt. A report by the Federal Reserve Board and US Treasury (2000) concluded that subordinated debt could potentially increase market discipline. See also Hawkins and Turner (2001) p 448.

established to restructure the banking sector buying non-performing loans and issuing bonds – has been important.

World Bank and IMF (2001, p 297) lauds securitisation as "an advanced stage of market evolution ... [which] allows for better management of balance sheets" but warns that a sound market for securitised mortgages requires "a land registry system, an effective bankruptcy law, efficient foreclosure procedures, reliable property valuation, proper mortgage loan underwriting and modern technology in loan processing and servicing". Alles (2001) describes how deficiencies in legal, accounting and taxation issues have impeded development of mortgage-backed securities and other forms of securitisation in emerging economies. One example is Mexico, where currently sales of assets from an originator to a vehicle are taxed, unless the originator retains the right to buy back the asset. However, this conflicts with the approach preferred by supervisors of a "clean break", unambiguously removing the asset from the bank's balance sheet. Another example is Malaysia, where a disincentive to securitisation is being removed by eliminating stamp duties. Tax issues have been cited as an important impediment in Thailand as well. Legal impediments are being explicitly addressed currently in Brazil and Indonesia, and in India a bill facilitating securitisation will shortly be introduced into parliament. The Basel Committee currently has a group working on ensuring the New Capital Accord creates neither incentives nor disincentives for securitisation: see BCBS (2001).

Perhaps the area with most potential for securitisation is home mortgages. In emerging economies, private institutions have often failed to set up such a market. As a result, in both Hong Kong and Malaysia, the central banks have been instrumental in setting up mortgage corporations, which purchase mortgage loans from banks and securitise them. Argentina and Korea have also moved to develop such markets. In Chile the Superintendency of Banks has recently allowed banks to open their own securitisation agencies. Other areas where securitisation is common in some advanced economies are credit cards and car loans, other products whose pricing does not depend on specialised knowledge but more objective criteria such as income and collateral. This could be a growth area in emerging economies.

A potential benefit for supervisors is that securitisation may give useful market estimates of the credit-worthiness of companies. This can assist in more accurately valuing banks' loan books.

3.4 Banks as guarantors

Banks may earn fee income by guaranteeing full, or partial, repayment on corporate bonds ("credit enhancement"). Since the Asian crisis, there has been both a marked reduction in the willingness of banks to guarantee bond issues, and a downgrading of the ratings of many banks. In Korea the proportion of bonds guaranteed has fallen from over 90% to under 10%. In Malaysia, prior to July 2000, the central bank required all corporate bonds issued to be rated investment grade and this required some form of bank guarantee where the company itself was not sufficiently highly rated.

As with securitisation, this gives rise to an off-balance sheet credit risk, and supervisors will require the bank to hold appropriate additional capital. In Thailand, banks are subject to a limit of 25% of their capital in their combined exposure to a company from lending, holding bonds, providing guarantees and underwriting. Some supervisors prefer specialised institutions, not banks, to provide guarantees.

3.5 Banks as underwriters

Banks may also act as underwriters for corporate bond issues, promising to take up themselves any shortfalls if corporate bonds cannot be sold at an agreed minimum price (maximum yield). Banks then take on market risk rather than credit risk. Data on the extent of underwriting are poor, but the extent varies greatly across economies. It is estimated that over 90% of corporate bonds in Hong Kong are underwritten. All listed corporate bonds in Indonesia and Korea are underwritten, as are almost all in Mexico and Hungary. In contrast, only 12% of corporate bonds issued in Malaysia last year were underwritten, and in Chile and Peru hardly any corporate bonds are underwritten. In some countries underwriting is limited to securities houses rather than banks. Alternatively, banks may only offer "best efforts" underwriting, where they make no promise to take up unplaced paper.

In India and Poland, recently, corporate bonds have mainly been sold through private placements with banks and other financial institutions. There are possible concerns about the lack of transparency in these practices. The Reserve Bank of India issued guidelines in June 2001 regarding required due

diligence, disclosures and credit risk analysis. Banks have been advised to adopt an internal system of rating issuers. Further prudential guidelines along these lines are proposed.

Such bond market activities may bring diversification benefits to banks. There may be economies of scope as banks have access to better information about firms to which they lend than would independent securities firms, and they can use their branch networks for marketing.[6] However, the extent of these benefits is arguable, and pricing underwriting is difficult. There is a risk that many underwriting lines may be called on if the economy slows down. As a result, some supervisors limit banks' involvement in this activity. In India, a bank can only underwrite up to 15% of an issue. In Indonesia, banks are not allowed to do any underwriting; this business is restricted to licensed securities companies. Underwriting may be best left to foreign banks, with their greater "placement power" resulting from their large global customer base.

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[6] See Hawkins and Mihaljek (2001, p 35) and Shirai (2001, pp 41-2) and references cited therein for further discussion.

Improving liquidity in government bond markets: what can be done?

M S Mohanty[1]

1. Introduction

Domestic bond markets in emerging market economies (EMEs) have seen a significant growth in recent years. Nevertheless, as the experience of the countries reviewed in this paper shows, lack of liquidity remains a major obstacle to their development in practically all countries. The benefits of developing a liquid bond market go beyond financing government deficits at lower costs. First, a liquid government bond market will facilitate pricing of other and riskier financial assets. Second, it has a direct impact on the degree to which other segments of financial markets (forward and futures markets, including foreign exchange hedging) can be developed to support risk management functions. Third, the depth of money and bond markets has a decisive influence on the effectiveness of central banks' monetary policy. Finally, the yield curve in a liquid bond market carries important information for the conduct of monetary policy.

This paper looks at what governments and central banks can do to promote liquidity in government bond markets. Section 1 discusses dimensions of market liquidity and examines whether the size of a country influences its choice. Section 2 deals with some of the macro policy issues that have implications for liquidity in the government bond market. Section 3 turns to issues in developing primary markets, while Section 4 addresses some of the challenges facing countries in enhancing liquidity in secondary markets.

1.1 Dimensions of market liquidity

Market liquidity has several dimensions and there is no one satisfactory definition that captures all the features of a liquid market.[2] Nevertheless, some of the important characteristics by which a market could be judged liquid are its relative tightness, depth and resilience. Tightness, measured by the bid-ask spread, provides an idea about the costs incurred by market participants in executing transactions; the lower the spread, the higher is the market liquidity. While the depth of the market determines the extent to which it can handle large transactions without causing sharp changes in prices, resilience determines the speed with which price fluctuations finally dissipate. Another factor could be the size of the market, as markets with large outstanding stocks generally see high turnover in cash and futures trading.[3]

The following trends are discernible from Table 1:

- First, spreads for "on-the-run" bonds vary from a low of 1-2 basis points in India, Korea and Brazil to 25-50 basis points in the Philippines. Spreads in the range of 5-10 basis points in Hong Kong and Singapore appear to be comparable to those of 4-7 basis points in some of

[1] The paper is based on the statistical inputs provided by the relevant central banks and has benefited immensely from their comments. It also draws on discussions with private sector market participants about the functioning of the debt markets in emerging market economies. Special thanks go to Palle Andersen, Renato Filosa, John Hawkins, Eli Remolona, Setsuya Sato and Philip Turner for extensive comments on the draft, to Marc Klau and Michela Scatigna for very useful statistical assistance and to Patricia Mosquera for secretarial help. Thanks are also due to Jochen Metzger and Agustin Villar for helpful comments. Views expressed in this paper are the author's own and do not necessarily reflect those of the Bank for International Settlements.

[2] See CGFS (1999, 2001) and Borio (2000) for a review of concepts of market liquidity and the factors determining it.

[3] See McCauley and Remolona (2000).

the mature bond markets.[4] Very low spreads in some countries may not provide an accurate picture of liquidity if the volume traded is also low. In a majority of economies, however, spreads seem to be much higher than those observed in mature markets.

- Second, except for a few economies (notably Hong Kong, Israel, Malaysia and Poland), the depth of the secondary market, as measured by the ratio of turnover to average outstanding stocks appears to be low. The typical ratio in EMEs is between 1 and 5% compared to about 7% seen in Japan and the United Kingdom and over 20% in Canada and the United States.
- Third, liquidity also appears to be concentrated in only a few benchmark issues. For example, in about half the economies for which information is available, only one or two maturities are highly traded while in mature markets liquidity is usually high for a wide range of benchmark issues.

Lack of liquidity in government bond markets raises a number of issues. One question is to what extent the size of an economy may operate as a constraint in developing a liquid bond market. In other words, should size determine the choice? Second, to what extent could policy be helpful in improving the functioning of the primary and secondary markets? Third, in particular, what role could central banks play in enhancing liquidity?

1.2 Should the size of a country influence its choice?

Some have argued that the potential benefits of a domestic bond market may not be realisable for small countries. One reason may be that the smallness of the market could limit the feasible range of marketable instruments and their effective tradability; see Turner and Van't dack (1996). A small investor base and few market players imply that central banks may have to play a market-making role that is not conducive to the objective of maintaining price stability. Moreover, it is argued that secondary market liquidity develops only when the bond market is relatively large. This is because much of the infrastructure needed to develop a liquid bond market (for example, a well developed stock market and an automated payment and settlement system) requires a minimum turnover in order to function smoothly and cost-effectively. European experience suggests that bond markets became deeper after the adoption of a common market and currency.

A second argument could be that the small number of market players and the dominance of a few players may reduce competition in the bond market and distort yields. Instances of major institutional investors acting in concert to seek higher yields on government bonds have been common in small countries. For example, two to three banks account for a market share of over 70% in Iceland, Malta and Sri Lanka; see Turner and Van't dack (1996). One of the reasons why a money market did not develop in Sri Lanka was the oligopolistic behaviour of two state-owned banks, which exerted undue pressure on the call money rate. This problem, however, is not unique to small countries. For example, the share of the top five banks in the total assets of the banking system exceeded 80% in Israel, Russia, South Africa and Thailand in 1999 and the median ratio for the EMEs was about 60%; see Hawkins and Mihaljek (2001). Concentration ratios in the non-bank financial sector are even higher, as a few public financial institutions dominate activity in the pension and insurance sector.

Yet a number of innovative ways have been suggested to develop local bond markets in small countries. One way to increase competition has been to allow entry of foreign banks and securities firms into the financial sector and create the necessary level playing field. An important example is Taiwan, which developed its capital market by allowing entry of foreign banks and securities firms into the local financial sector; see Shih (1996).

[4] Within mature markets, spreads are much lower in the United States (1½-3 basis points) and much higher in Japan (7-9 basis points).

Table 1

Indicators of liquidity in government bond markets

	Typical bid-ask spread[1]		Most important maturity	Ratio of turnover to average outstanding stock in 2000[2]	Daily average volume of OMO by the central bank in 2000[3]
	"On the run" bonds	"Off the run" bonds			
India	1		10 years	3	105
Hong Kong	5-10		...	22	...
Singapore	5	10-15	3 months, 1,2,5,7,10,15 years	4.7	...
Indonesia	...		3 years	0.5	1,097
Korea	1	1	3 years	9.1	5,290
Malaysia	3-5	5-10	3,5,10 years	24	2,375
Philippines	25-50		2,5,7,10 years		1,010
Thailand	2-3		5-7 years	1.1	1,250
Brazil	2	50	Fixed rate bill[4]	...	...
Chile	...		8 years	3.5	289
Colombia	40		5 years	0.2	248
Mexico	10-15	10-25	3 years	2.5	790
Peru	...		5 years	...	23
Czech Republic	20		10 years	1	485
Hungary			3,5,10,15 years		
Poland	5-25		2,5 years	31	4,290
Israel	...		5-10 years	46	0.3
Saudi Arabia	20		2-5 years	0.5	702
Memo					
United States	3	6	1,2,5,10,30 years	22	
Japan	7	7	2,4,5,6,10,20 years	6.9	
Germany	4	5	2,4,5,10,30 years		
United Kingdom	4	4	5,10,20,30 years	7	

[1] In basis points. [2] In percentages. [3] In millions of US dollars. [4] Currently matures in May 2002.

Source: Central banks.

Another possibility could be internationalisation of the capital market; for example, by allowing offshore entities to hold and issue local currency bonds. This requires a strong economic base and a relatively stable currency. The entry of foreign investors into government bond markets is likely to enhance liquidity by increasing the total investor base and adding to market sophistication. If offshore entities

are also permitted to issue local currency bonds, they could increase supply of high-quality paper, providing an alternative diversification opportunity to domestic investors and adding liquidity to the market. An important example is Singapore, where the local bond market deepened significantly after the government allowed highly rated offshore banks, multinationals and domestic companies to issue bonds in local currency. Recently, the government has permitted even unrated companies to issue local currency bonds provided they sell them to sophisticated investors.[5] To prevent speculative trading in the Singapore dollar, the offshore issuers are, however, required to either swap out the proceeds into foreign currency or use the funds raised to support economic activity in Singapore. A third possibility, which might look appealing in the context of small market size and incomplete market infrastructure, is to develop regional bond markets[6] (see Box 1).

Box 1

Regional bond markets

Building the infrastructure required for a well developed bond market is subject to significant time and resource costs. Consequently, many, particularly small, EMEs are caught in a vicious circle of low liquidity and underdeveloped markets. This situation provides a rationale for coordinated attempts to pull issuers and investors together and develop bond markets on a region-wide basis. Additional arguments in favour of such attempts are that name familiarity reduces information asymmetries and the same time zone eliminates settlement (Herstatt) risks. On the other hand, a major disadvantage of regional bond markets is that they do not provide instruments that would strengthen monetary policy operations in individual countries.

Cooperation in developing a regional bond market might take several forms. One arrangement could be to encourage countries to use regional financial centres to issue bonds in regional or international currencies along the lines of the euro-dollar and euro-yen markets. For the host country, development of offshore markets could mean further deepening of local bond and foreign exchange markets and more diversification opportunities for domestic investors. In Asia, the Japanese government has offered to provide funds and guarantees for the acquisition of sovereign or semi-sovereign bonds issued by other Asian countries ("new Miyazawa initiative"). The proposal was meant to pool the large amounts of excess savings in the region and reinvest the funds in local debt instruments. This would eliminate currency and maturity mismatches, both of which were primary causes of the Asian crisis. For several reasons, progress to date has been disappointing. There are no credit rating agencies or clearing and settlement systems at the regional level. Cross-border transactions in securities as well as trading mechanisms are absent and listing rules and tax treatments have not been harmonised. Finally, regional credit enhancement and guarantee agencies are missing and there is no common currency for the denomination of sovereign bonds.

Regional cooperation could also be strengthened by encouraging domestic financial institutions to invest in bonds issued by other countries within the same region. Although no formal cooperation schemes exist in practice, banks and institutional investors in EMEs have increasingly sought to diversify into bonds of neighbouring countries. Hong Kong expressed its willingness to invest in high-quality Asian debt papers if they were rated properly and priced at market clearing rates; see Tsang (1998). Hong Kong also offered to function as a clearing and settlement centre for the Asian bond market. However, as pointed out in the paper by Choy in this volume, the scope for regional diversification may be limited by the high degree of co-movements among markets. In Latin America, this has meant that institutional investors look towards developed markets for asset diversification and stay away from bonds issued by neighbouring countries.

Other ways of promoting regional bond markets and attracting local and international investors include the creation of a regional bond index or even a synthetic regional bond based on a basket of major regional currencies. However, these forms of cooperation are difficult to realise, as they may ultimately require a regional currency unit.

[5] See the paper by Lian in this volume.

[6] See a recent proposal by Sakakibara (2000) in the context of developing a regional bond market in Asia.

2. What can policies do to develop a liquid bond market?

This section discusses the broader policy framework to improve liquidity in the government bond market, leaving the specific role of central banks and governments in boosting primary and secondary market liquidity to later sections.

The role of policy could be critical in several directions such as the extent to which the bond market is allowed to function according to market-clearing principles and the nature of policy coordination between the government and the central bank. The overall financial sector policy affecting the investor base and the conduct of monetary policy also has significant implications for the depth and maturity of the bond market.

2.1 Market-determined interest rate

Many have emphasised the role of incentives in improving liquidity in bond markets, particularly allowing the interest rate to be determined by market forces. Accordingly, in most countries, interest rate liberalisation typically preceded the effort to develop a domestic bond market accompanied by a shift away from administrative determination of bond rates to auction-based sales. However, some argue that conditions in EMEs may prevent interest rates from being fully determined by market forces. One factor is that, in countries with high public debt, allowing interest rates to rise may threaten the sustainability of fiscal policy.

Another reason why interest rates may not be fully market-determined is the notion that the market-clearing rate is not always the "appropriate rate". Some have pointed out that the tendency of authorities to believe that markets may, at times, not generate a competitive price could significantly weaken investors' confidence and hinder the development of bond markets; see Fry (1997). This may be true if the rules of the game are not strictly according to market principles. For example, auctions may be cancelled because rates are not deemed appropriate,[7] or the debt manager fixes a minimum reserve price for the auction, or keeps the right to allocate less than the amount announced if price dispersions are too high.[8] In Korea, prior to the 1998 crisis, the government set a maximum rate for the auction, which was generally below the market interest rate. While this resulted in a frequent underallocation of the announced amount, the shortage was filled by the government bond underwriting agency at an interest rate lower than the average rate in the auction; see Kim, Y (2001).

It is difficult to judge how far intervention may be desirable. For instance, if the bond market is dominated by a few big players this may bring collusive pressure on prices, providing the rationale for intervention by the debt manager. As pointed out in the paper by Al-Jasser and Banafe in this volume, an important reason why the government prefers preset, fixed price bonds to auctions is the concern that a small group of banks could manipulate the market. Second, it has been argued that in the absence of a liquid secondary market, restricting the scope of indirect instruments of monetary policy, central banks may use primary auction rates to signal interest rate changes. In this case, auction rates are more likely to be influenced by central banks' objective assessment of demand conditions and not purely by demand and supply conditions in the bond market. Third, central banks' intervention may also be prompted by particular market conditions that, for example, lead to a sudden rise in the risk premium. For example, in India, the central bank accepted large amounts of private placement of bonds from the central government to avoid the impact of increased market uncertainty on interest rates. With the easing of uncertainty, the central bank sold these securities in the open market.[9] Fourth, some have argued that, in a thin market, the day-to-day movements of interest rates could be high and cause interest rates to deviate from their equilibrium level for a long time. Under this circumstance, by reserving the right to fix a minimum price, the government may give a clear indication

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[7] For example, in Mexico, auction bids were rejected in the wake of the 1995 financial crisis and in September 1998 at the peak of the Russian crisis. Argentina cancelled auctions in the wake of the Mexican crisis in 1995 and in 2001 when investors demanded high interest rates.

[8] For example, in Brazil, the debt manager can withhold full allocation or cancel the auction if the price dispersion among bidders is too high; see Credit Suisse (2000).

[9] See the paper by Reddy in this volume for the approach followed to reduce sharp volatility in yields.

to markets that low bids are not acceptable; see Gray (1997). Such a situation may not arise in countries where markets are deep enough to throw up a price that would normally be expected.

This also raises a related question: should stabilising bond rates be an important concern of the central bank, in order to promote the bond market? One view is that if the capacity of banks and other investors to manage interest rate risks is weak and there is limited opportunity for hedging such risks, excessive volatility in interest rates could discourage investors from bond markets. The counterview is that too much concern on the part of the central bank to contain rate volatility could dampen the development of futures markets, discourage risk-taking activity and reduce liquidity in the bond market.

Moreover, interest rate flexibility could be constrained by investment restrictions and the health of the banking system. The banking system in developing economies is typically subject to a higher statutory liquidity ratio than in industrial countries and many require insurance and pension funds to hold a large part of their investment in government bonds. In the initial stage, a high liquidity ratio could be desirable for developing a domestic bond market as it helps finance government deficits from market sources and ensures success of the auction programme. Maintaining a high liquidity ratio could also be defended on prudential considerations.[10] On the other hand, investment restrictions tend to blunt competition in the bond market, leading to lower than market-clearing rates, and reduce incentives for active trading by banks and other institutions. They also tend to be associated with slow progress in moving towards mark to market practices in the financial system, with major implications for risk management practices and liquidity in bond markets. Another factor for rigid bond market rates could be a weak banking system. This may lead a government to resist an interest rate increase in the bond market because of its adverse consequences for profitability and solvency of the banking system.

There are, in short, several convincing reasons for intervening in the market. Nevertheless, these interventions lead to underdeveloped markets. The adverse implications of deviating from market principles for the economy have been well demonstrated by country experiences. Many, therefore, argue that central banks could be better able to influence interest rates by putting in place an active liquidity management strategy and committing credibly to price stability. Industrial countries' experience shows that when commitment to market-determined rates is strong and interest rates are allowed to move in both directions, volatility in interest rates is significantly reduced through more diverse expectation formation and trading positions taken by the market participants.

Echoing these views, there was a broad consensus among the participants in the meeting that central bank intervention in the price-setting process is undesirable. It was felt that when markets were small, central bank intervention in such circumstances ran the risk of sending a wrong signal to the market. Moreover, central banks' action might lead to "habit formation" among market players. However, it was also argued that intervention might be desirable when market volatility stemmed from exogenous shocks.

2.2 Coordinating debt management and monetary policy

Policy coordination is an important requirement when the central bank is directly involved in developing a bond market. Because of potentially conflicting objectives of debt management and monetary policy – the former focused on the cost/risk trade-off to minimise the borrowing costs to the government and the latter on price stability – close coordination between these two policies is desirable. One reason could be to ensure that price stability remains the main concern of the central bank. A second reason could be that the move to a market-determined interest rate does not threaten fiscal sustainability and prove counterproductive to the objective of promoting financial markets. A third reason could be that the confidence of the market in the authorities' commitment to market principles is not weakened by the overlapping responsibilities of the central bank. For instance, debt management operations are not influenced by inside information on interest rates within the central bank; see World Bank and IMF (2001).

[10] For example, this is an important reason for the relatively high liquidity requirement in Hong Kong and Singapore.

In most industrial countries, debt management operations are separated from the central bank's monetary policy operations, with the government using the primary market to issue bonds while the central bank uses the secondary market for liquidity operations. Minimising borrowing costs to the government is achieved through product innovation and improvement of the price discovery process. While direct credit from the central bank to the government has been eliminated in major industrial countries, sale and purchase operations of government bonds by the central bank are primarily driven by monetary policy considerations. Typically, in this model, explicit coordination between the two policies is restricted to the tactical level, ie information sharing between the central bank and the treasury regarding the liquidity situation in the market. Implicit coordination is achieved through the use of financial markets, such as the central bank giving signals about interest rate conditions to the treasury and, at the same time, extracting information from the yield curve for monetary policy operations; see Blommestein and Thunholm (1997). In a situation of conflicting objectives, it is normally monetary policy that dominates over debt management policy.[11]

In most EMEs, the responsibility of managing government debt lies with the treasury (Table 2). Central banks play the role of debt managers in Hong Kong, India, Malaysia, Saudi Arabia and, to some extent, Singapore. Many countries have abolished or sharply restricted direct financing of government deficits by the central bank. In countries where the fiscal situation is strong and inflation has been low, central banks may have a greater degree of flexibility in promoting bond markets. In countries where fiscal deficits remain high, the need for coordination may have increased with the move to market-determined interest rates. While a high fiscal deficit leads to a steep yield curve, a tight monetary policy could further worsen the situation by raising interest rates. At the same time, the central bank's support to government may be constrained by excess demand in the economy.

Resolving this conflict requires a significant degree of policy coordination. Some argue that keeping the responsibility of debt management with the central bank might facilitate coordination. One important example is India, where the central bank has had to address the twin responsibility of funding a large fiscal deficit and restricting monetary growth. The Reserve Bank of India adopted a number of ways to resolve the two conflicting objectives. While the central bank directly absorbed a part of the central government bond issues in its portfolio, it later mopped up excess liquidity through open market sales. The reduction of reserve requirements and interest rate cut by the central bank also helped relieve pressure on interest rates.[12]

The need for coordination may also arise in countries with persistent fiscal surpluses, particularly when the central bank issues its own paper for monetary policy operations. Here the challenge might arise from coordinating maturity, issue size and auction schedule of both types of instruments. This also raises the issue as to whether the central bank should continue to issue its own paper after the treasury bill market has reasonably developed. One disadvantage of having identical instruments is that they fragment the market. Bills issued by the central bank have implications for its balance sheet.

Country practices differ significantly in dealing with this issue. In Hong Kong, for example, the public sector bond market consists predominantly of central bank issued papers, ie Exchange Fund Bills and Notes. In Chile, because of the history of fiscal surplus, the government has rarely issued bonds. The central bank primarily uses its own paper for monetary policy operations. In Mexico, the central bank issued its own securities for the first time in 2000 for sterilised intervention in the foreign exchange market. This decision was guided by the consideration that issuing large amounts of government bonds for sterilising liquidity would affect the yield curve; see the paper by Sidaoui in this volume.

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[11] A typical example of this hierarchical distinction of objectives is given by the experience of the United Kingdom. Prior to 1995, one of the objectives of the country's debt management policy was to "support and complement monetary policy". After the 1995 review this was changed to "ensuring that debt management policy is consistent with monetary policy". See Bank of England and HM Treasury (1995).

[12] As a medium-term goal, the Reserve Bank of India has proposed separation of debt management from monetary policy operations. This objective would be facilitated by the development of financial markets, better control of fiscal deficit and the introduction of the required legislative framework (see the paper by Reddy in this volume).

Table 2

Institutional arrangements for debt and reserves management

	Central government: domestic currency debt	Central government: foreign currency debt	State/local government: foreign currency debt	SOEs: foreign debt	Reserves
China	MoF	MoF	not allowed	SOEs	SAFE
India	CB	MoF	not allowed	SOEs	CB
Hong Kong	CB	...	...	SOEs	CB
Indonesia	MoF	MoF	not allowed		CB
Korea	MoF	MoF	own responsibility[1]	SOEs[2]	CB
Malaysia	CB	CB/MoF	own responsibility[1]	own responsibility	CB
Singapore	MoF & CB	none			CB
Thailand	DMO under MoF	DMO under MoF	none	MoF	CB
Argentina	MoF	MoF	own responsibility		CB
Brazil	MoF	MoF and CB[3]	not allowed	SOEs	CB
Chile	MoF	MoF	not allowed	MoF	CB
Colombia	MoF	MoF	state govts/MoF	SOEs, MoF	CB
Mexico	MoF	MoF	not allowed	SOEs, MoF	CB
Peru	DMO under MoF	DMO under MoF	DMO under MoF	MoF	CB
Czech Republic	MoF	none	MoF[4]	SOEs	CB
Hungary	DMO under MoF	DMO under MoF			CB
Poland	MoF	MoF	own responsibility		CB
Israel	MoF	MoF	own responsibility	SOEs	CB
Saudi Arabia	CB	CB			CB
World Bank survey	MoF (55%) CB (11%) MoF & CB (30%) other (4%)	MoF (51%) CB (11%) MoF & CB (30%) other (8%)			

Note: CB = central bank; DMO = debt management office; MoF = ministry of finance; SAFE = State Administration of Foreign Exchange; SOEs = state-owned enterprises.

[1] Require approval of Ministry of Government Administration and Home Affairs. [2] Require approval of Ministry of Planning and Budget. [3] CB for domestically issued dollar-linked debt. [4] MoF has only weak restrictive powers; large municipalities are largely autonomous.

Sources: Jensen (1999); central banks.

The discussion in the meeting revealed a number of practical approaches followed by countries in enhancing cooperation between the debt management and monetary authority. For example, in some countries the government issued shorter maturity bonds (for example, monetary stabilisation bonds in Korea) for monetary operations by the central bank while bonds for longer maturities were issued for market development. In countries where central banks acted as fiscal agents, the policy conflicts were usually resolved through constant dialogue with the government regarding the details of debt

management operations. Some countries also converted a large part of the non-marketable government debt to marketable debt to reduce the problem of shortage of securities with the central bank for open market operations.

2.3 Broadening the investor base

A key challenge facing many countries is how to broaden the investor base so as to reduce the heavy reliance on a captive market. A broader investor base improves bond market liquidity not only because of the size effect but also because having a large number of investors with diverse risk profiles enables smooth dissipation of market shocks. Moreover, a large investor base generates incentives for financial innovation, leading to greater market dynamism and lower transaction costs. Broadening the investor base poses challenges. One view is that relaxation of investment regulations will reduce banks' holding of government bonds. The counterview is that while this may be a short-term consequence, banks' demand for government bonds is likely to increase over the medium to long term as investing in these bonds becomes part of their normal portfolio decision-making.

Increasing the number of investors implies promoting institutional investors and attracting foreign investors to the government bond market. It has been well recognised that institutional investors, such as pension and insurance funds, play a critical role in boosting liquidity in government bond markets. They promote a wholesale market for government bonds, increase arbitrage activities through their diversified portfolio and boost liquidity particularly in long-term securities. By providing a countervailing force in financial systems dominated by banks, they intensify competition and promote market transparency; see Vittas (1998). However, it has been pointed out that some of the beneficial effects on market liquidity would be restricted if the institutional investors adopt a "buy-and-hold" policy.

Pension and insurance reforms have played a particularly important role in developing bond markets in Latin America. In Asia and Central Europe, the role of pension funds in government bond markets has, so far, been limited because there are insufficient funded schemes in the public and private sectors. Significant progress has, nevertheless, been made in recent years to increase the participation of domestic institutional investors. For example, in Singapore, the share of fixed income investments in total investment of insurance companies has shown a sharp increase from 30% in 1999 to 49% by September 2001. A larger involvement of institutional investors in the bond market may also require a certain minimum financial infrastructure and an adequately developed bond market in the first place before a dynamic interaction is set off between investors and market liquidity.

Foreign investors can also play an important role in broadening the investor base and enhancing liquidity in secondary markets. Nevertheless, in many countries (with some notable exceptions such as Mexico and Hungary) foreign investors play a marginal role in government securities market. Some believe that increased participation of foreign investors could make emerging markets more susceptible to market volatility, especially because such investments may accentuate financial market responses to existing macroeconomic imbalances. It is also argued that foreign investors with their enormous resources could dominate activity in the local bond market. On the other hand, the risks of investing in EMEs' local bond markets (eg foreign exchange risks, liquidity and settlement risks) could be high. Like domestic institutional investors, foreign investors may also require a reasonably liquid market before increasing their stake. The paper by Sidaoui in this volume points out that relaxation of restrictions on foreign investors at the end of the 1980s led to a substantial increase in secondary market liquidity in Mexico, but the impact has declined since 1994. Most foreign participants now hold long positions on peso interest rates through foreign exchange forwards rather than directly investing in government papers.

Some argue that individual investors have only a limited role in promoting liquidity. Individual investors play a much greater role in the local bond markets through mutual funds, which diversify risks on their behalf. Many countries have, therefore, promoted mutual funds and some have set up specialised gilt funds for promoting a small investor base. For instance, in Mexico, regulations that restricted mutual funds' investment in short-term instruments have been relaxed recently to allow these funds to play a more active role in the government securities market. Others have argued for a more direct participation of individual investors in developing bond markets on the grounds that this would reduce

the reliance of governments on captive investors, promote a fixed income investment culture among households and increase competition in the deposit market.[13]

2.4 Developing money markets

A well developed money market reduces liquidity risks for bondholders by providing access to the immediate cash market. It also facilitates the emergence of a sovereign yield curve, as money market benchmarks lead to the development of long-term yield curves. When the money market is not well developed and the overnight rate is volatile, investors face heightened liquidity risks that limit their ability to undertake maturity transformation. A simple indicator of the development of money markets is given by the volatility of the daily interbank rate, since illiquid markets often witness high volatility of interest rates. As Table 3 shows, the standard deviation of overnight rates in EMEs declined substantially in 2000 compared to the levels in the mid-1990s. In many countries, however, the volatility of short-term rates is still high.

Table 3

Volatility of short-term interest rates[1]

	Mean		Standard deviation	
	1995	**2000**	**1995**	**2000**
Asia[2]	9.5	6.1	0.9	0.3
Latin America[3]	27.1	11.6	5.6	1.0
Central Europe[4]	27.7	14.8	1.9	0.9
Memo				
G3[5]	3.8	3.6	0.4	0.4

[1] Based on daily interbank or call money rates. [2] Unweighted average of China, Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [3] Unweighted average of Argentina, Brazil, Chile, Colombia, Mexico and Peru. [4] Unweighted average of the Czech Republic, Hungary and Poland. [5] Unweighted average of Germany, Japan and the United States.

Sources: Bloomberg; Datastream.

Chief among the reasons for lack of depth of money markets are the high reserve requirements. While only a few countries exempt their banking systems from reserve requirements (eg Hong Kong and Mexico), the typical requirement in EMEs exceeds 5% and in some cases 10% compared to the usual 0-3% seen in most industrial economies (Table 4). It is well recognised that when reserve requirements are low, averaging provisions can stabilise the overnight rate by making banks' reserve demand sensitive to interest rates; see Borio (1997) and Van 't dack (1999). But, when the reserve requirement is high, this "buffer function" is limited. For instance, one important reason cited by India for high volatility in call money rates was the high reserve requirement. It made banks focus on overnight funding and encouraged a few lenders to stay in this market to earn arbitrage profits. While many EMEs exclude interbank borrowing from the reserve requirement, eliminating the distortion that this would create for interbank transactions, the reserve compliance period in many cases tends to be shorter than the usual one-month period seen in major industrial countries. Most countries, nevertheless, allow averaging and some allow a minimum daily ratio to reduce the probability of banks borrowing heavily towards the reserve compliance day.

[13] See, for example, Patil (2001) in the Indian context. Recently, Singapore took a major initiative to promote an individual investor base, where intermediaries have been involved in increasing public awareness of investing in bonds by organising retail bond fairs; see the paper by Lian in this volume.

Table 4

Reserve requirements in EMEs

December 2001

	Reserve requirement on banks		Reserve compliance period
China	6%		Quarterly
India	Cash Reserve Ratio		Fortnightly
	5.5% for commercial banks, urban scheduled cooperative banks[1]		
	3% for regional rural banks and other cooperative banks		
Hong Kong	None		...
Singapore	Minimum Cash Balance : 3%		Fortnightly
	Minimum Liquid Assets : 18%		
Indonesia	5%		Fortnightly
Korea	2.9%		Fortnightly
Malaysia	4%		Fortnightly
Philippines	11% for commercial banks		Weekly
	0% for rural and cooperative banks		
Thailand	6%		Fortnightly
Brazil	45% on demand deposits[2]		Fortnightly
	10% on time deposits[3]		
Chile	Local currency	9% on demand deposit	
		3.6% on time deposit	
	Foreign currency:	19% on demand deposit	Monthly
		13.6% on time deposit	
Colombia	Local currency		Fortnightly
	13% on current account deposit		
	6% on saving deposit		
	2.5% on CDs		
Mexico	None		...
Peru	Foreign currency		Monthly
	Implicit required reserve ratio: 34%		
	Marginal required reserve ratio: 20%		
Czech Republic	2% on primary liabilities vis-à-vis non-banking subjects		Monthly
Hungary	6% (5% from August 2002)		Monthly
Poland	5%		Monthly
Israel	6% on deposits up to 6 days' maturity		Monthly
	3% on deposits on 7 days up to 6 months		
	0% on longer-term deposits		
Saudi Arabia	7% on demand deposits		Monthly
	2% on time/saving deposits		

[1] Effective from 29 December 2001. [2] 45% of the average daily balance exceeding BRL 2 million. [3] 10% of the balance exceeding BRL 30 million.

Source: Central banks.

Central banks' accommodation policies also have an important influence on the development of the money market. While an easy accommodation policy may encourage banks to transact with the central bank and discourage active liquidity management by banks, a too restrictive policy may make interest rates more volatile. Second, the success of central banks' liquidity management operations in reducing rate volatility depends on how accurately they forecast daily movements of autonomous liquidity. This can pose difficulties when the government's cash management is weak and intervention in foreign exchange markets is frequent. In Mexico, the central bank has addressed these two concerns by allowing the exchange rate to be relatively flexible and requiring the treasury to provide one-day advance notice of movements of cash balances in the government account. Many countries have set up formal mechanisms for coordinating day-to-day treasury cash management. Third, the flexibility of operating procedures has implications for the central bank's role in stabilising rates. As the industrial country experience shows, increased reliance of central banks on discretionary market operations (rather than standing facilities) and signalling mechanisms strengthen their influence on short-term interest rates. Conversely, when central banks do not stabilise the overnight rate at some reference value by making available market-clearing reserves, interest rate uncertainty tends to be higher.

The development of money markets has also been hampered by country-specific market imperfections. For instance, the factors affecting money market development in India include the presence of non-bank participants in the interbank market, the prevalence of a system of cash credit to borrowers which places an undue burden of fund management on banks, and regulations preventing banks from paying interest on deposits of below 15 days' maturity. In South Africa, until recently money market liquidity was adversely affected by an oligopolistic market structure. A few banks with considerable market power dominated the repo market, resulting in relatively inflexible money market rates and uncertain liquidity flows to a large number of market participants; see Casteleijn (2001). The central bank changed its operating procedure to a fixed rate repo system and encouraged banks to square positions in the interbank market before coming to the repo window.

3. Issues in primary market development

Boosting bond market liquidity requires developing a dynamic primary market. Because the government bond market is characterised by a special type of market imperfection, where a monopoly seller meets oligopoly buyers, the government should credibly precommit to a set of issuing policies that encourage investors to bid in a desirable way; see Das and Sundaram (1997). While pre-commitment would help establish transparency, given the informational asymmetries between the seller and the buyers, it is no guarantee that the government would obtain the most competitive sale price. Choosing an auction technique that improves the price discovery process is, therefore, important to maximising revenue for the government and improving market efficiency.

3.1 Choice of auction technique

The auction techniques generally followed in treasury markets are discriminatory and uniform price auctions. There is no clear-cut superiority of one technique over the other. Discriminatory price auctions enhance market competition as each bidder is under pressure to quote a successful price, and since securities are allotted at the bidding price, they also maximise revenue for the government at a given demand curve. However, a key disadvantage of the discriminatory price auction is that it penalises successful bidders who paid a higher price than the cutoff price and are likely to incur a mark to market loss through lower resale value of their securities in the secondary market (called the "winner's curse"). This encourages them to shade their bidding price downwards and lower their demand for bonds, with implications for revenue. Switching to a uniform price auction (allotment at the cutoff price to all successful bidders) could eliminate this bias and the related cost of gathering information for bidders, raise the potential demand for bonds and encourage bidders to bid a higher price. Empirical evidence supports the view that uniform price auctions increase revenue to the government compared to discriminatory price auctions; see Bartolini and Cottarelli (1997). But, an important disadvantage of the uniform price auction is that it is more vulnerable to market collusion, particularly in thin markets.

The choice between the two auction methods depends on specific market conditions. Some have argued that when markets are well developed, there would be little by way of difference in the market-clearing prices between the two auction methods, even though a uniform price auction saves the large cost of gathering information by the bidders.[14] In developing markets, the choice of uniform price auctions has been defended on the grounds that this lowers the "winner's curse", which could attract more investors to auctions. Others have argued that where markets are thin and uncertainty about prices is high, discriminatory price auctions could be a better option. Moreover, information gathered through discriminatory auctions could be used to further develop the market; see Feldman and Mehra (1993). To minimise the potential problems of both the auction techniques some have suggested a hybrid auction system, where a maximum price limit could be applied to a multiple price auction.

As Table A1 in the Annex shows, EMEs seem to be fairly divided between the auction types. Auctions are not in use in Indonesia, where a large part of bonds are recapitalisation bonds, or in Saudi Arabia, which issues preset coupon bonds to banks and other financial institutions. Korea has recently switched to a uniform price auction to reduce the problems of the "winner's curse". India has introduced a uniform price auction for 91-day treasury bills on an experimental basis though a complete migration is constrained by lack of empirical evidence on the possible cost difference to the government; see Thorat (2001). In Mexico, only fixed coupon bonds are sold through uniform price auctions. An important example of a uniform price auction is Columbia, where all allotments at the auction are done at the single cutoff rate. If the auction amount is lower than all the accumulated bidding at the cutoff rate, then all bids below the cutoff rate are accepted. Provisions also exist for additional placement at a second round, if demand at the first round exceeds the initial offer by a significantly high margin.

3.2 Participation in auctions

Should participation in auctions be restricted to only a few specialised dealers? Should there be an upper limit on individual bidding, and to what extent should non-competitive bidding be allowed? Should the central bank participate in auctions and, if so, in what form?

Broad participation is normally preferred to improve competition, but it could increase processing costs and time. An open-to-all policy could also pose problems for the payment and settlement system. An important example of unrestricted access is the United Kingdom, which allows written bids by anyone a day prior to the auction date. At the other extreme, some countries restrict auction participation to only a specialised group of dealers. However, a majority of countries seem to prefer broader participation that may include primary dealers, banks and institutional investors. Many countries also prefer to set both a maximum (to circumvent the potential problem of market cornering) and a minimum limit on individual bids (to discourage retail participation). The typical ceiling on individual bids varies between 20 and 30%. For example, in Singapore, a primary dealer can bid up to a maximum of 20% of the issue while others can go up to 15%.

The issue of whether and to what extent non-competitive bids should be allowed depends on specific objectives. Some countries allow non-competitive bids for a limited part of the auctioned amount, with the allotment done at the cutoff price or a weighted average price. The allotment is restricted to a select group of investors to encourage retail participation and protect them from the "winner's curse". Some allow primary dealers to have access to non-competitive bids as a special privilege for their market-making role. From the issuer's point of view, non-competitive bids could increase the investor base by attracting those investors who would otherwise stay away from the auction, fearing that the price would be too high; it also increases the certainty about full subscription of the issue. Country experience suggests that a limit of 20% is generally preferred for non-competitive bids to ensure that a high limit does not reduce competition. Some countries also prefer to place a limit on the quantum of non-competitive bids by any individual bidder (for example, Singapore).

Another critical issue is the central bank's participation. Many countries by law prohibit direct financing of the government deficit by the central bank through purchase of securities in the primary market. In

[14] This explains why the experimental switching of auction technique from a discriminatory price to a uniform price auction in the United States in the early 1990s did not produce significant price differences.

some countries (eg Malaysia), while legal provisions do not restrict the central banks from directly purchasing from the primary market, they have chosen not to do so. In Singapore, the law permits the central bank to participate either as a competitive or non-competitive bidder to obtain securities for monetary policy operations. On the other hand, the Bank of Mexico can only purchase securities from auction when the government places the proceeds of the purchase as a term deposit with the central bank with the terms similar to those of the acquired security. It can also participate as a non-competitive bidder to replace its maturing stocks. In India, the central bank sometimes acquires central government bonds at the cutoff yield and accepts private placement of securities from the central government to transmit signals to markets, particularly during periods of high market uncertainty.

The varying practices followed by central banks simply illustrate the objectives behind central banks' interest in the primary market. To the extent that monetary policy operations are the main concern, central bank participation as a non-competitive bidder can achieve the objective without producing much market distortions. But, when central bank intervention is motivated by a price objective, market yields could be distorted.

3.3 Primary dealer system

Many countries have set up primary dealers (PDs) to promote bond markets (see Annex Table A2), while others (for example, Chile, Indonesia, Israel and Peru) do not have dedicated government securities dealers but typically rely upon banks and institutional investors for creating a market for government bonds. However, these agents do not have the rights or obligations of market-makers.[15] The advantages of having a dedicated group of market-makers are that they can guarantee success of the auction, promote liquidity in the secondary market by providing two-way quotes and eliminate the problems of conflicting objectives inherent in giving the responsibility of market-making to banks. As pointed out in the paper by Al-Jasser and Banafe in this volume, a major reason for the underdeveloped bond market in Saudi Arabia is the poor involvement of banks in creating a market for government securities. Both lack of monetary incentive and fears of losing deposits have reduced banks' involvement in the securities business. But, a system of PDs also involves providing them certain privileges, which might create an unequal field and restrict competition. For this reason, countries may prefer not to have them.

In most countries, PDs are obliged to take active part in the primary market by fulfilling a minimum bidding commitment, underwriting issues, and so forth. For example, in Mexico and Singapore each PD is required to bid an equal share of the auction amount. In others, they could be expected to bid a constant share of the primary issues (eg 10% in Malaysia). Many countries require PDs to provide two-way quotes in the secondary market, and in some they are obliged to maintain a minimum share in secondary market trade (eg 2.5% in Malaysia). In industrial countries, while PDs normally have an obligation to bid in the primary market and share information with the central bank, particularly relating to the "when issued" market, only a few countries (notably Belgium, France, Italy and the United Kingdom) impose an obligation to quote.

An important question is whether an obligation to quote might impair the financial health of PDs or, alternatively, lead to a high bid-ask spread, which could dampen trading and market liquidity. Some have argued that providing a relatively high spread is necessary for ensuring financial soundness of the PDs since markets tend to be volatile in their initial stages of development. This may provide a rationale for restricting competition among dealers and allowing them to reap monopoly rent in return for the externalities they create; see CGFS (1999). On the other hand, if a high spread discourages trading and reduces market liquidity, a fine balance between the market-making role of PDs and ensuring their financial viability may have to be struck.

In many countries, PDs have been granted certain privileges for their market-making role, including exclusive or restricted access to auction and central bank open market operation, access to non-competitive bidding, liquidity support from the central bank and the facility to borrow securities from the central bank. Some countries also provide PDs access to the interbank market (India), reduce their

[15] The pattern is the same for industrial countries: Japan, Germany and Switzerland have a developed government bond market but without a system of primary dealers. In contrast, Canada and Italy have a two-tier PD system, where certain PDs have elevated rights and obligations; see Inoue (1999).

mandatory liquidity requirements (Malaysia) or guarantee that the central bank will act as a last resort supplier of bonds under certain conditions (Hong Kong).

Providing special privileges to PDs, nevertheless, raises a number of issues. One is whether giving a special credit line to PDs from the central bank compromises monetary policy objectives. If PDs enjoy a standing facility from the central bank, they can use it at their discretion and potentially affect monetary policy. Second, providing a short selling facility to the PDs, ie allowing them to sell a security not in their possession, might raise certain systemic risks (see the next section). In Mexico, the central bank has limited this risk by requiring PDs to submit collateral against securities lending and subjecting it to a "haircut" of 2% and a premium of 5% over the overnight rate. In Hong Kong, PDs can incur short positions within the margin limits imposed by the central bank, provided that the net aggregate position in all eligible securities held by a PD is not short. Borrowing the shorted security from the central bank is subject to collateral at a financing cost linked to the collateral. A third issue is whether privileges should be provided to PDs on an open-ended basis or only for a limited period. It has been argued that the monopoly position of PDs should not be treated as permanent since this can encourage inefficiency. As pointed out in the paper by Reddy in this volume, continued support from the central bank may also encourage PDs to take undue risks.

Another question is the criteria to be followed in selecting PDs. Given the nature of risks handled by PDs and the large capital base needed for their operation, banks and financial institutions are normally allowed to set up primary dealers. It is also argued that if banks have to take an active interest in setting up primary dealers, the regulatory costs need to be kept at a reasonable level, or they may not allocate sufficient capital for securities business; see IOSCO (1999a). More importantly, decisions need to be taken as to whether PDs should function both as brokers and as securities dealers, since the dual role could give rise to conflicts of interest, leading to problems of "front-running". Nevertheless, keeping these functions completely separate (eg by having a separate capital requirement) might dampen trading and market liquidity. Finally, it has been argued that capital and regulatory requirements for setting up PDs should not be so strict as to block entry, creating an oligopolistic market structure.

4. Liquidity in secondary markets: policy and market microstructure

Poor bond market liquidity can often be traced to lack of depth of the secondary markets. This raises the question of what central banks and treasuries could do to improve the depth of secondary markets and the role that market microstructures play in promoting bond market liquidity.

4.1 What could central banks and treasuries do?

Repurchase transactions

One important way in which central banks have been involved in enhancing liquidity in secondary markets is by using government securities as collateral for their lending operations. Repurchase transactions ("repos") are said to be ideally suited to develop secondary markets since, unlike outright operations, they do not require a liquid bond market in the first place; they do not affect securities prices except indirectly; and they have temporary impacts on liquidity. Repos enhance bond market liquidity by allowing market participants to borrow against their securities portfolio, generally below the unsecured borrowing rate. As pointed out in the paper by Figueiredo et al in this volume, an important reason why the central bank in Brazil has preferred repos for conducting liquidity management operations is that outright operations can cause unintended volatility in bond prices and the yield curve. On the other hand, outright bond operations could be preferred when central banks intend to influence interest rates directly. Such operations also have a permanent impact on market liquidity. A recent example has been the intervention by central banks to address the liquidity impact of the 11 September attacks. Many central banks moved quickly to enhance liquidity and lower interest rate expectations in the securities market through outright bond operations. Collateralised lending operations backed by government bonds could also be an important way to improve liquidity, especially in countries relying on uncollateralised standing facilities for their monetary policy operations.

As Table 5 shows, central banks in most countries have introduced repos or collateralised lending facilities. While most central banks using repo operations typically lend/borrow against central government or their own securities, a few include other instruments as well. For example, Thailand uses state-guaranteed enterprise bonds for central bank repos along with government papers. Similarly in Malaysia, the central bank can conduct repos in any liquefiable security (with low counterparty credit risk and easily convertible into cash). In Mexico, bonds issued by some agencies and banking papers are also included for repo operations.

Table 5

Repo and collateralised lending by central banks

	Government papers	Central bank own papers	Other securities
China	√		
India	√		
Hong Kong	√		
Singapore	√		
Indonesia	√	√	
Korea	√	√	Government-guaranteed bonds
Malaysia	√	√	Liquefiable assets (with low counterparty credit risk; easily convertible in large sums into cash at short notice)
Philippines	√	√	
Thailand	√		Government-guaranteed state enterprise bonds
Brazil	√	√	
Chile		√	
Colombia	√	√	Bonds issued by two government agencies
Mexico	√	√	Some agencies and banking papers
Peru	√	√	
Czech Republic		√	
Hungary	√	√	
Poland	√		
Israel	Repo market under consideration		
Saudi Arabia	√		

Source: Central banks.

Secondary market liquidity could also be improved by encouraging interbank repos in government bonds. In many countries, however, the interbank repo market is not well developed and the overnight market for funds is largely uncollateralised. One reason could be lack of a liquid term money market, which makes it difficult for market participants to borrow or lend beyond overnight using government securities. Second, if the interbank market is shallow, a proper benchmark interest rate may not develop, complicating the pricing of repos. Third, lack of sound collateral and inclusion of repo

transactions in the instruments eligible for reserve requirements have hampered development of the repo market in some countries. Fourth, the presence of a large number of weak financial institutions, absence of proper legal remedies in case one party fails to deliver its commitments and high settlement risks could heighten counterparty credit risks. Lastly, as pointed out by Kim, S (2001), an important reason for the underdevelopment of the interbank repo market in Korea has been that financial institutions are relatively insensitive to credit risk in their short-term lending operations and have preferred uncollateralised to collateralised lending.

Securities lending/borrowing operations

Many have pointed out the importance of securities lending/borrowing transactions in boosting market liquidity. This requires permitting market participants to short sell a security and, at the same time, enabling them to borrow the shorted security temporarily from its owner with a contractual obligation to redeliver at a later date. Securities lending operations promote liquidity by preventing settlement failures and increasing arbitrage opportunities. Another potential benefit of securities lending transactions is that they provide opportunities for fund managers and institutional investors to earn additional income from their idle security holdings. This, in turn, has implications for fund flows in the money market. Primarily because of their favourable impact on market liquidity, many industrial economies relaxed restrictions on domestic and cross-border securities lending transactions during the 1990s.

Only a few EMEs (notably Hong Kong, Mexico and Singapore) allow short selling. One reason could be poor risk management practices on the part of market participants and the heightened risks to the financial system. Securities lending transactions require market participants to manage actively all aspects of risks arising from such operations. This includes continuously assessing credit risks arising from the probability of failure of one party to deliver, managing market risks stemming from changes in collateral values and instituting an adequate internal control system for monitoring risk exposure limits; see IOSCO (1999b). Second, underdeveloped market infrastructure, particularly the payment and settlement system, could restrict the potential use of securities lending transactions as they involve complex settlement procedures, including a shorter settlement cycle and the need for settlement at both ends of the operation. Third, lack of an adequate legal system to ensure strict enforceability of financial contracts and bankruptcy laws could restrict the use of securities lending transactions to boost bond market liquidity.

Finally, systemic implications of securities lending transactions could be a concern. Since such transactions encourage high leveraging by market participants and provide additional channels by which shocks can be transmitted through the securities market, they pose systemic risks especially to weak and undersupervised financial systems. A major risk could also arise from the possibility of speculators using the securities lending facility to short the domestic currency.

Nevertheless, many have argued that these risks can be controlled through proper regulation of the financial system. In countries whose financial systems are well supervised and strong, allowing short selling by market participants could help develop a liquid bond market. However, it requires deciding on who should be allowed to short a security – whether only securities dealers or banks and others as well – and the securities that can be shorted. In the meeting, several countries saw developing a "when issued" market as a first step in introducing a short selling facility. There was a general consensus among the central banks that short selling can have an important stabilising influence on the bond market as market volatility was generally higher when market participants did not have recourse to short selling to alter their portfolio.

Developing benchmarks

Developing certain benchmark securities with high liquidity characteristics has been considered important in improving liquidity in bond markets. Benchmarks are important not only for developing a risk-free yield curve but also for reducing the servicing costs to government. Savings to government from selling benchmark issues are estimated to be in the order of 5-15 basis points in developed countries; see Goldstein and Folkerts-Landau (1994). Moreover, the availability of benchmark securities with different maturities (regarded as "on-the-run" issues) helps develop hedging markets and improve trading since the prices of these securities trade close to par and are thus better able to capture the market interest rate. Another important benefit of benchmark securities is that they are preferred by active traders and are less likely to be cornered by investors who hold to maturity; see

CGFS (1999). In addition, development of a benchmark yield curve could encourage mark to market practices and increase trading volumes.

However, developing benchmarks may also pose several challenges. First, debt managers may not be able to push forward the maturity structure when the degree of macroeconomic uncertainty is high and dampens demand for long-term instruments. Few countries have substantial bonds with maturity beyond 10 years. Bonds are also limited in the five to 10-year maturity range in many countries (see Table 11 on page 32). The average maturity of government stocks tends to be shorter in Latin America and central Europe than in Asia.[16] Despite recent progress in issuing longer-maturity papers, the average maturity has changed only a little (Table 6). Moreover, where most investors "buy and hold", the scope for developing benchmark issues could be limited. The large stock of non-marketable debts, mainly saving bonds and special purpose government bonds, also reduces the availability of benchmark instruments.

Table 6

Average remaining maturity of outstanding government bonds (years)

	1990	1995	1998	2000
India	...	...	6.5	7.1
Hong Kong	...	...	1.4	1.2
Singapore	3.1	3.4	3.8	4.1
Indonesia	...	...	...	6.0
Korea[1]	...	...	6.0	5.2
Malaysia	8.1	5.2	5.2	4.7
Philippines	15.0	17.3	13.5	14.7
Brazil	0.7	0.7	1.7	2.5
Colombia	...	2.0	4.4	3.5
Mexico	...	0.8	1.2	1.5
Peru	7.0	7.6	7.2	6.4
Czech Republic	...	1.4	1.0	1.7
Hungary	0.5	1.0	1.5	2.3
Poland	...	...	4.5	2.6
Israel	6.4[2]/0[3]	5.2[2]/10.0[3]	4.4[2]/13.0[3]	3.6[2]/11.1[3]
Saudi Arabia	2.0	6.5	6.5	6.0

[1] Distribution by original maturity. [2] Domestic. [3] International.

Source: Central banks.

A strategy followed by many countries in developing benchmarks has been to concentrate issuance on a few important maturities. This avoids the problem of market fragmentation arising from issuing a large number of maturities with small issue size. For example, major industrial countries have generally concentrated on issuance of four to seven maturities; see Inoue (1999). In EMEs, the benchmark status of securities varies widely across countries (column 3 of Table 1) and a particular problem is that only one or two maturities are heavily traded.

[16] Hong Kong is a major exception, as the average maturity is just above one year.

Nevertheless, many countries have taken specific initiatives to develop benchmark issues. Korea integrated the issuance of Grain Fund Bonds into treasury bonds, which increased the share of marketable bonds in new issuance. In addition, in order to increase the supply of a three-year benchmark issue, the average size of issuance was doubled between 1998 and 2001. Many countries have also followed the practice of reissuing an existing loan to consolidate maturities and develop benchmarks. For instance, India has followed a strategy of "passive consolidation" of securities by reopening the existing highly demanded loans; RBI (2001). Similarly, in Thailand, for the first time, in 2000, the debt manager replaced a large amount of maturing stocks by reissuing them with the existing terms and features; MOF, Thailand (2001). In Singapore, the policy has recently shifted towards replacing a maturing security with a new issue with similar tenor and fixing a minimum size for benchmark issues.

Countries with low fiscal deficits have tried to develop benchmarks by buying back the less liquid securities through bond conversion, outright repurchases (alternatively known as "coupon pass") and reverse auctions and replacing them with new liquid instruments.[17] An important recent example is Canada, which uses quarterly reverse auctions to call back old loans before they mature so as to keep a constant supply of benchmark issues; see Gravelle (1998). Similarly, Singapore introduced reverse auctions to buy back small-sized, off-the-run securities. Other countries could also use buyback options to increase benchmark issues. One problem could arise if the original bond contract did not contain a buyback option. This would call for legal changes in the local security law. For instance, the new debt management law in Thailand includes a provision enabling the debt manager to buy back a government security. Second, if institutional investors hold most of the illiquid bonds, the success of buyback operations would critically depend on the extent to which these investors are willing to change their portfolio.

Mark to market practice

A key issue in improving secondary market liquidity is the extent to which bondholders are required to mark their portfolio to market. Absence of mark to market practices encourages investors not to book accrued gains and losses in their portfolio, reducing the incentive to trade. Even where mark to market practices are in force, it remains to be decided how frequently securities should be valued and whether valuation should be at a fixed point or at the time of sale. Needless to say, this decision affects the sale and purchase decisions. As can be seen from Table 7, few countries require their banks and other institutional investors to fully mark to market. Many have regulations that differentiate according to the type of instruments and their holders. In Israel, bonds designed to be "held to maturity" are not marked to market and institutional investors are exempt from mark to market requirements. In Chile, instruments that have a secondary market are marked to market. In the majority of countries, only trading portfolios are marked to market and those "held to maturity" are valued at cost price. Some countries (India) restrict the holdings that can be put under the "held to maturity" category. Not all countries require banks and institutional investors to mark to market on a daily or monthly basis.

[17] In a typical bond conversion operation, the bondholders are given the option to convert their holding of less liquid bonds to more liquid benchmark issues, with the conversion rate being either decided at auction or predetermined by the government. In an outright repurchase operation, the government would ask the dealers to sell it securities of a particular maturity range at their offer price or directly ask the bondholders to sell in the "over-the-counter" market. A reverse auction is the opposite of the regular bond auction, where the bidders submit their offers to sell rather than buy securities.

Table 7

Mark to market practices

	Institutions required to mark to market	Nature of mark to market (MMT) practices
India	Banks, financial institutions, mutual funds	Bonds held by banks and financial institutions for trading purposes or available for sale must be MTM monthly and quarterly respectively
		Bonds held by mutual funds must be MTM daily
Hong Kong	Banks	Bonds held for trading purposes must be MTM
Singapore	Banks, IIs	Bonds held for trading purposes must be MTM (adoption of fair value standard for the accounting of financial instruments is under way)
Indonesia	Banks, IIs	Bonds held for trading purposes must be MTM
Korea	Trust accounts, banks and IIs	All investment grade bonds held in trust accounts in banks, investment trust companies and mutual funds must be MTM daily
		In addition, bonds held by other financial institutions (banks, merchant banks, securities companies and insurance companies) for trading purposes (available for sale) must be MTM quarterly
Malaysia	Banks	Bonds held for trading purposes must be MTM
Philippines	Banks	Bonds held for trading purposes must be MTM
		Bonds held indefinitely to meet liquidity must be MTM
Thailand	Banks, IIs	...
Brazil	Banks	...
Chile	Banks, pension funds, insurance companies	Instruments in the secondary market must be MTM
Colombia	Banks, IIs	Bonds held for trading purposes must be MTM
Mexico	Banks, pension and mutual funds	Bonds held by banks for trading purposes must be MTM
		Portfolios held by pension and mutual funds must be MTM daily
Czech Republic		Bonds to be sold must be MTM
		Trading portfolios must be MTM daily
Hungary	Banks, investment and pension funds, Insurers	Trading portfolios for banks and investment companies
		Unit-linked portfolios for insurers
		Whole portfolios (on a daily basis in case of public open-end funds) for investment funds
		Provision on daily MTM valuation will come into force on 1 July 2002
Poland	Banks, IIs	Bonds held by banks for trading purposes must be MTM
		Less liquid bonds are valued according to a fair value rule
Israel	Banks	Bonds held for trading purposes or available for sale must be MTM
Saudi Arabia	Banks	Bonds in the trading account must be MTM

Note: IIs: institutional investors.

Source: Central banks.

An important constraint in marking to market could be the lack of risk management practices among the large public sector pension and insurance companies. One view is that since these institutions have fixed future liabilities, they could better achieve their objectives by holding assets that provide them assured fixed cash flows. A strategy based on active trading of their holding of bonds would expose them to market risks. The counterview is that to the extent that these investors are sheltered from competition and hide x-inefficiencies, the return they provide to their investors is low. Therefore, regulations that require them to mark their portfolio to market would encourage them to pay a higher return to their clients. One example is Korea, where the introduction of mark to market practice for bonds held in the trust accounts of banks and investment trust companies has resulted in an increase

in trading volume, reflecting more aggressive trading behaviour by these bondholders. Ultimately, reforming the pension and insurance sector could fully mitigate this problem. An important question raised in the Singapore paper is whether the government and the central bank should take a proactive approach in educating corporate treasurers and fund managers about sophisticated risk management operations so as to improve their interest in government securities.

Another constraint could arise from the weakness in the banking sector, which might restrict the extent to which full mark to market practice could be introduced. On the other hand, the absence of proper mark to market practice for banks could have adverse implications for the financial system. As pointed out in the paper by Al-Jasser and Banafe in this volume, a large part of banks' holding of government securities in Saudi Arabia is marked at cost and this encourages them to run a large unhedged interest rate exposure.

A third practical problem that may arise is the lack of adequate pricing guides for marking to market. India has addressed this problem by entrusting the primary dealers with making available a reference curve to market participants (see Box 2). Korea has launched a similar initiative by establishing private pricing agents, which will provide accurate information on bond prices for mark to market valuation. Mexico has set up independent price vendors for this purpose. The central bank also publishes its own prices on a daily basis as a benchmark for evaluating the performance of price vendors; see the paper by Sidaoui in this volume.

Box 2

Construction of a fair value curve – the Indian experience

In the absence of a proper benchmark yield curve, prior to March 2000, the Reserve Bank of India (RBI) used to make available pricing guidelines to banks and other market participants at the end of the financial year for valuing their government securities portfolio. The RBI changed this system to a new arrangement under which the Fixed Income Money Market and Derivative Association of India (FIMMDA) and the Primary Dealers Association were given the responsibility of arriving at market prices that could be used for valuation purposes.

After consulting a group of experts, the FIMMDA has developed a system of constructing a fair value curve through the Bloomberg service provider. The methodology uses prices of 15 top benchmark securities from maturity ranges between one and 20 years polled from various active market participants at 4 pm on every working day. The data collection is automatic as Bloomberg provides a special page where the participating banks put their bid and offer prices at 4 pm for selected benchmarks which are then transferred to Bloomberg's valuation system. To ensure a system of checks and balances, a three-member group chosen on a rotating basis from participating institutions is required to vet the accuracy of the data at the end of each month. The group also reviews the benchmark securities to be included.

Bloomberg uses a three-step procedure to generate fair market curves for many bond sectors. First, a bond map is generated using the screen data. Then multiple term structures are iterated. Finally, the best-fit term structures are derived and applied to obtain fair values for unpriced bonds.

Source: FIMMDA, March 2001.

In countries where swap markets are well developed, a swap curve could provide an alternative for valuing fixed income securities. Swap markets are usually very liquid and swaps can be issued frequently without requiring a position in underlying assets. Swap rates also tend to be highly correlated with yields on fixed-income securities such as corporate bonds and mortgage-backed securities. However, unlike government bond yields, they embed the credit risk of the counterparty. Because of these features, swap curves have been used extensively as a close substitute for sovereign yield curves for marking to market. For example, the use of swap curves for pricing fixed income securities has seen a substantial growth in industrial countries, with the shrinking supply of new sovereign benchmark issues; see Ron (2000).

Among EMEs, currency and interest rate swap markets are fairly developed in Chile, Hong Kong, and Singapore. Recently, interest rate swaps have been introduced, for example in India, Peru, Poland

and Saudi Arabia. Swap markets have not, however, picked up substantially in many countries due to the lack of a deep interbank market. The key players in swap markets are usually foreign banks.

Broadening the range of instruments

Could broadening the range of instruments help deepen the secondary market? The choice of debt instruments typically depends on several considerations: market preference, cost to government and, in some cases, monetary policy objectives. In Latin America and some central European countries, the pattern has been to issue floating rate bonds and bonds indexed to inflation or the exchange rate. In Saudi Arabia, floating rate notes were introduced in 1996 to broaden the range of instruments and diversify price risk. Investors' preference for floating rate bonds is generally high when they are uncertain about the level of future interest rates; this could also be an easy means for governments to borrow. But floating rate bonds usually shorten the maturity profile of debt, transfer market risks to the government and might constrain monetary policy from raising interest rates. Country experience with floating rate bonds suggests that lack of a suitable benchmark rate has restricted development of FRN markets. To overcome this problem, central banks in Latin America have been publishing a key reference rate, which is used widely for benchmarking FRNs.

Indexed bonds are more attractive to long-term investors, who prefer a fixed real return on their assets. They could also reduce interest costs to the government by eliminating the inflation risk premium and serve a useful monetary policy function by providing a market indicator of inflation expectations; governments might also use them to enhance the credibility of their anti-inflation programmes. Exchange rate indexed bonds could also attract investors, although they pose the problem of exposing governments to external shocks. However, as discussed in the paper by Sidaoui in this volume, in Mexico liquidity in inflation-indexed bonds has been rather poor since most of these bonds are held by pension funds, which do not trade actively.

Many countries have issued market-friendly debt instruments such as zero coupon discount bonds. These instruments offer special cash flow advantages to investors and may temporarily reduce government borrowing costs. In Mexico, for instance, zero coupon bills (cetes) have the second largest annual turnover in the secondary market. Another method designed to deepen the secondary market is to allow "stripping" of securities, by which a conventional security could be allowed to trade as two separate bonds, one for the coupon payment and the other for the principal payment. Stripping can accommodate diverse cash flow needs of investors and thus broaden the investor base and improve secondary market liquidity. Chile's experience shows how bond stripping can help improve liquidity; see the paper in this volume by Cifuentes et al. While the central bank issued long-term bonds to establish benchmarks, the coupon payments from these bonds complicated the determination of a yield curve since coupons also included some amount of capital. Since the introduction of stripping in 1999, the benchmark status of these bonds has improved significantly.

Developing forward and futures markets in government bonds constitutes another strategy for enhancing liquidity in secondary markets. They increase hedging activity and promote risk management practices. Since cash and futures markets are closely linked by flow of information and expectation, the overall liquidity effects of futures markets in government bonds could be substantial. Many countries have started to see this impact. An important example is Korea. Since the government relaxed restrictions on futures trading in government bonds there has been a sharp rise in futures contracts; trading in the futures market has exceeded that in the spot market since the beginning of 2001. In Singapore, the recent narrowing of swap spreads is attributable to the liquid market for derivatives. The government has recently introduced five-year bond futures. In Chile, derivatives on central bank issued paper constitute an important segment of the futures market (banks can also make derivatives on corporate bonds and mortgage-backed securities), although banks have generally preferred derivatives based on foreign currencies to those based on sovereign bonds.

Taxation issues

Because taxes on transfers of financial instruments impose an explicit transaction cost, their removal can improve trading and liquidity in bond markets. On the other hand, it is argued that income from government securities should be subject to normal income tax in the same way as private debt instruments. A similar argument applies to providing special tax benefits to government bonds, because of their potential crowding-out effects. But, if income from government securities is withheld, it could add to operational costs when securities frequently change hands, requiring adjustment of the

tax component in the bond price. For these reasons, many industrial countries have abolished explicit transaction taxes on government securities and restricted withholding tax to individuals.

Taxation arrangements concerning government securities vary significantly across countries (Table 8). Many countries do not tax government bonds of any form. A few countries levy an explicit tax on financial transactions but most exempt government security transactions from stamp duty. Withholding tax appears to be a common feature in many countries; a few apply it at a reduced rate compared to the general income tax rate and differentiate between residents and non-residents. In Korea, the levy of withholding tax was changed recently from the point of transfer to the point of coupon payment to facilitate securities lending and repo operations.

Table 8

Tax arrangements for government bonds

	Are stamp duties applied to trades on govt bonds?	**Transaction tax**	**Are withholding taxes applied to interest on government bonds?**
China	Yes	...	No
India	No	No	Only for foreign institutional investors
Hong Kong	No	No	No
Singapore	No	No	No
Indonesia	No[1]	No	Yes, 15%
Korea	No	No	15% for residents, different rates for others
Malaysia	No	No	20% for non-residents
Philippines	Yes, only on the primary market issues		Yes, at the point of interest payment (20%)
Thailand		Equivalent of US$ 2.25 per transaction for institutions; $0.50 for individuals	1% for domestic institutional investors 15% for individual investors 15% for non-resident investors
Brazil	...	0.38%	20% for residents 15% for non-residents
Chile	No	No	No
Colombia	...	...	Yes, 7%
Mexico	No	No	No
Peru	No	No	No
Czech Republic	No	No	15% on coupon payments for residents
Hungary	...	...	0% on income on government bonds (otherwise 20%), different rates for non-residents
Poland	No	No	Legal entities: interest and discount income as well as income from sale of treasury securities are subject to income tax. Private persons are exempt from taxes
Israel	Yes, on the secondary market	...	Yes
Saudi Arabia	No	No	No
Memo			
United States	–	No	No
Japan	–	No	Yes
Germany	–	No	Yes
United Kingdom	–	No	No

[1] Except a very small amount charged to the sellers.

Source: Central banks.

4.2 Issues in market microstructure

It has been well recognised that trading arrangements and the degree of market transparency have an important influence on the price discovery process and market liquidity. A trade execution process that leads to more competition among traders and improves the information flow to market participants is generally said to lower spreads and increase liquidity. There is an unresolved debate in the market microstructure literature about what constitutes an ideal market structure for boosting trading and liquidity in bond markets.

Trading arrangements

An important advantage of a dealer-based or "quote-driven" market is that it provides greater immediacy to traders and guarantees them liquidity even under uncertain market conditions. A dealer-based market might also reduce the clearing and settlement burden by reducing the number of players among whom cash and securities transactions have to be squared. Some have also argued that since price discovery in government bond markets is relatively easy, given the fact that traders are guided by benchmark securities, an organised exchange may not seem all that important for reducing transaction costs. This explains why bond markets in many industrial economies tend to be quote-driven markets. On the other hand, organised exchanges are said to lead to more efficient price discovery since they enhance the information flow among traders and lead to more informed trading behaviour. In countries where the degree of competition in bond markets is low, dealers might extract monopoly rent by keeping their bid-ask spreads at a relatively high level. This would argue for centralised order processing through organised exchanges. Moreover, organised exchanges facilitate development of futures markets.

In most EMEs, trading in government bonds is through dealer-based OTC markets. There are, however, important exceptions. In Israel all trading in government bonds take place through stock exchanges, while in Chile pension funds are required to trade in stock exchanges. In Colombia, trading in electronic stock exchanges accounts for roughly half of the total trading in government bonds. Country experiences differ with respect to the success achieved in enhancing trading of government bonds in organised stock exchanges. For example, while the national stock exchange in India provides facilities for wholesale trading of government bonds under transparent market conditions, the volume traded is significantly lower than that in the OTC market. One of the reasons why electronic trading in Korean stock exchanges has not picked up is the prevalence of broking through personal networks between dealers and institutional investors. In many countries, trading has been relatively low although government bonds are listed on the stock exchange. Possible reasons include high transaction costs due to thinness of markets, a low degree of market transparency and high settlement risks.

Market transparency

It is argued that a transparent market that disseminates pre-trade and post-trade information to traders lowers spreads, improves efficiency and attracts more participants by increasing their confidence in the pricing process. This is particularly so if the bond market is dominated by a few informed traders who can extract better prices from less informed traders. It is also argued that transparency and market efficiency are non-linearly related; high transparency beyond a point may increase price volatility, expose market-makers to undue risks and might even increase spreads by reducing dealers' need to compete for order flows. See Bloomfield and O'Hara (1999) and CGFS (1999).

Market transparency relates to the functioning of both primary and secondary markets. Many argue that the best possible course to improve primary market transparency is to preannounce an issue calendar and publish maximum information about post-auction results. Publishing an issue calendar would demonstrate governments' commitment to accept the price generated in auction; it would also help market participants to formulate their bidding strategy in advance. An issue calendar could also have significant informational value by promoting a "when issued" market. A major disadvantage, however, is that the government loses the flexibility to deal with market uncertainty if it precommits to an issue calendar. Publishing a wide range of information on post-auction results would enhance investors' confidence in the auction process and improve their bidding skills. For example, the usual practice followed in OECD countries is to publish post-auction information on the volumes of bids, allotments made, weighted average yields and the spread between the average and lowest accepted price immediately after the closing of auction.

Although most EMEs have regular auction schedules and typically announce the size of auction a few days in advance (generally not exceeding seven days), only some announce an issue calendar (Annex Table A1). Only a few prefer to announce one on an annual basis. India has an issue calendar for treasury bills, announced on a half-yearly basis. An important constraint faced by the Reserve Bank of India in announcing an issue calendar for bonds is the volatility in the government's borrowing requirement, which calls for flexibility of both issue size and timing to minimise its impact on interest rates; see Thorat (2001). While Mexico announces a quarterly calendar, it discloses the maximum amount on offer and the minimum possible amount for each security, which gives it flexibility to change the composition at the auction in response to changes in market conditions. In Israel, the size and timing of the auction are announced one month in advance. Singapore publishes an annual calendar but the exact size is made known a week prior to the auction date. An example of strict adherence to an issue calendar is Hong Kong, where the central bank announces an auction schedule every second month of each quarter for the subsequent quarter, followed up by confirmation of dates and issue size one week prior to the auction. "When issued" markets are non-existent in many countries. In Mexico the market is allowed to trade a security three days in advance of its actual issuance. In some countries, for example Korea, a "when issued" market has developed at the demands of the market participants rather than due to a strategy to develop a domestic bond market.

In recent years, many EMEs have introduced systems and practices for improving the degree of transparency in secondary markets. For example, Korea has introduced a system of inter-broker dealers in order to facilitate centralised dissemination of information about dealers' order flows. In India, a negotiated dealing system is being introduced that will facilitate electronic bidding and dissemination of information on trade flows on a real-time basis. Many countries have introduced legal changes empowering regulatory authorities to promote transparent market practices, impose prudential and supervisory standards over market intermediaries and improve surveillance of market transactions. One question is: who should regulate the government security market — the central bank or a security regulator? Another question concerns the extent to which the principle of self-regulation should apply to market intermediaries in government securities. In many countries, the trend has been to let the industry association of dealers develop a code of conduct for market intermediaries and to collect and disseminate information on volume and prices of trade flows.

Clearing and settlement system

In most countries, the clearing and settlement system in government bonds is centralised at the central bank (Table 9). Most economies seem to follow a book entry system of clearing and have introduced a delivery versus payment system (DvP). Some economies (for example, Colombia, Hong Kong, Israel and Singapore) have considerably reduced settlement risks by adopting electronic settlement systems with same- or next-day clearing of funds and securities. A settlement system based on gross principles requires market participants to be able to access intraday or overnight credit facilities from the central bank. This raises the issue whether central banks should be responsible for providing a credit facility to the participants for clearing and settlement in government securities and what consequences this might have for their liquidity management operations.

Another concern may arise from the transaction costs of the clearing and settlement system. Bond trading could be adversely affected when transaction costs are high. In Poland, high transaction costs for settlement have encouraged banks to avoid the national depository for securities settlement; instead, they have settled funds among themselves while giving lending advice to the settlement authority for effecting securities transfers.

Table 9

Settlement system for government securities

	Nature of clearing and settlement system
India	Settlement system centred at the CB (bonds transferred by DvP)
Hong Kong	Book entry system at the CB (settlement date T+0; DvP; RTGS)
Singapore	Book entry system at the CB (settlement date T+1; DvP; no physical transfer of bonds is necessary)
Indonesia	Book entry system at central registry at CB and a number of licensed sub-registries; (bonds transferred by DvP or "free of payment" method)
Korea	Book entry system for government bonds at the CB, for other bonds at the Korea Securities Depository (settlement date T+0)
	DvP system was introduced in 1999 but it covers only 30% of bond trades (other 70% of trades are implemented by traditional "free of payment" method)
Malaysia	Settlement system centred at the CB (RTGS)
Philippines	Settlement system centred at the CB (RTGS under way)
Thailand	Book entry at the CB for government securities (settlement date T+2; electronic real-time DvP method under way)
	Book entry at the Thailand and Securities Depository Co for corporate securities (settlement date T+2)
Brazil	Settlement system centred at the central bank and the national treasury (RTGS and settlement date T+0 planed for April 2002)
Chile	Settlement system centred at the central securities depository
Colombia	Settlement system centred at the central securities depository (settlement date T+0; RTGS)
Mexico	Book entry at the central securities depository (settlement at T+0, DvP)
Peru	Settlement system centred at the central securities depository
Czech Republic	Settlement and clearing centred at the Prague Stock Exchange (DvP under preparation)
Hungary	Settlement system centred at the Central Clearing House & Depository Ltd (security leg of the transactions and money leg of transactions made by investment companies) and at the central bank (money side of transactions made by banks)
	For stock exchange transactions multilateral net settlement system is applied (T+2, DvP), for OTC transactions (RTGS, T+0, DvP)
Poland	Bonds: book entry system at the National Depository for Securities (settlement date T+2)
	Bills: book entry system at the Central Registry of Treasury Bills at the NBP
Israel	Settlement and clearing centred at the Tel-Aviv Stock Exchange Clearing House, which acts as a central securities depository (settlement date T+1; DvP method)
Saudi Arabia	Book entry system at the CB (settlement date T+2; DvP, RTGS)

Note: RTGS = real-time gross settlement; DvP = delivery versus payment.

Source: central banks.

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Annex Table A1

Structure of the primary market, issuing techniques

	Are bonds issued by periodic tenders?	Frequency of tenders		Is there a preannounced calendar?	Is the size of auction announced in advance?	Type of auction	Typical average issue size[1]	Is "when issued" trading allowed?
		Bills	Bonds					
China	Yes	Bonds are issued to institutional investors (10 times a year) or to individual residents over the counter at commercial banks (3 times a year)		Yes, quarterly basis	...	Multiple price sealed tender method for bearing securities Uniform price sealed tender for discount securities	2,400 – 9,600	...
India	Yes	W		Yes, but only for T-bills (half yearly)	Yes, with the calendar for T-bills (in the case of dated securities, the amount is announced three days in advance)	Multiple price sealed tender method for 364-day T-bills and bonds Uniform price sealed tender for 91-day T-bills	400 – 1,300	Non-existent, but successful bidders are allowed to sell on the same day before transfer of securities
Hong Kong	Yes	W, F, M	Q	Yes	Yes	Multiple price	60 – 500	Yes
Singapore		W		Yes, yearly basis	Yes, 7 days before	Uniform price	400 – 1,400	Yes
Indonesia	No	...	...	...	...	...	...	...
Korea	Yes		W	Yes	Yes, 3 days before	Uniform price	1,500	Yes, but the market is not well organised
Malaysia	Yes		Q	Yes, yearly basis	Yes, 7 days before	Multiple price	500 – 1,300	Yes
Philippines	Yes	W	M, Q	No	Yes, 2 days before	Uniform price	90	No
Thailand	Yes	W	W	Yes	Yes	Electronic bidding expected late 2001/early 2002	670	No

Annex Table A1 (cont)

	Are bonds issued by periodic tenders?	Frequency of tenders		Is there a preannounced calendar?	Is the size of auction announced in advance?	Type of auction	Typical average issue size[1]	Is "when-issued" trading allowed?
		Bills	Bonds					
Brazil	Yes	W, M	W, M	Yes	Yes	Multiple price Uniform price	No typical size	Yes, incipient stage
Chile	Yes	Twice a week	W	Yes	Yes		9 - 88	Non-existent
Colombia	Yes		W	No	Yes, 2 days before	Uniform price	200	Non-existent
Mexico	Yes	W	M	Yes, quarterly basis	Yes, but only total size	Multiple price Uniform price for fixed coupon notes	105 - 2,100	Yes 96 hours in advance
Peru	No			No	Yes	Uniform price	...	...
Czech Republic	Yes		M	Yes	Yes	Multiple price		Yes
Hungary	Yes	W, F	M, Q, H	Yes	Yes	Multiple price		
Poland	Yes	W	M	Yes, yearly basis	Yes, 7 days before	Multiple price	700 - 900	Non-existent
Israel	Yes		W	...	Yes, 30 days before	Multiple price	0.05 - 0.15	Non-existent
Saudi Arabia	No	W	M	Yes	Yes		1,300 -1,900	Non-existent

Note: W = weekly; F = fortnightly; M = monthly; Q = quarterly; H = half-yearly.

[1] In millions of US dollars.

Source: Central banks.

Annex Table A2

Role of primary dealers

	Number of designated primary dealers	Obligations	Privileges from central bank
India	17	To take active part in primary and secondary market (broaden investor base and maintain a liquid secondary market) by providing two-way quotes To function as underwriters To fulfil bidding commitment	Allowed to keep securities with the central bank Access to interbank market Liquidity support from central bank
Hong Kong	26	To take active participation in primary and secondary markets (broaden investor base and maintain a liquid secondary market)	Exclusive right to deal with the CB in the secondary market CB acts as last resort supplier of Exchange Fund paper under certain conditions Allowed to incur short position in Exchange Fund paper
Singapore	12	To provide liquidity to Singapore Government Securities (SGS) market by quoting two-way prices To provide market feedback to central bank Assist in the development of SGS market	
Korea	30	To obtain at least 2.0% of annual primary issues To provide liquidity to market by quoting two-way prices and accept orders with face value equivalent of US$ 400,000 at the quoted prices To provide market feedback to government	Exclusive rights to bid at government bond auctions Exclusive access to dealer financing with a maturity of one month or less from government at a low rate
Malaysia	12	To participate in money market auctions undertaken by the central bank To bid at least 10% in primary issue of selected securities To make market for securities by providing two-way price quotations, and selling/buying them at quoted price	Access to CB discount window facility Undertake repos and reserve repos of less than 1 month maturity from non-licensed financial institutions
Philippines	38	To take an active part in primary and secondary markets	
Thailand	9	To take an active part in primary and secondary markets To facilitate conduct of open market operations	Exclusive channel whereby central bank conducts outright open market operations

Annex Table A2 (cont)

Brazil	25	...	...
Colombia	...	To obtain 4% of total amount of TES B bonds auctioned	Exclusive access to primary market and second-round auctions of bonds
Mexico	5	To bid at primary auction for cetes and bonos	Access to securities lending from central bank
		To maintain constant prices for cetes and bonos on secondary market	Right to bid for government securities in non-competitive auction
Czech Republic	...	To underwrite at least 3% of Government bonds offered in a quarter	Direct access to primary market
		To allow access to other investors, including retail	Sole or preferential access to secondary market
Hungary	13	Quote prices for a determined group of government securities to ensure liquidity in secondary market	Exclusive right to support issue of bonds and T-bills
Poland		In 2002 the Ministry of Finance will introduce a system of Treasury Securities Dealers	
Memo			
United States	37	To bid in auctions	
		To report	
France	12	To quote	
		To bid in auctions	
		To report	
United Kingdom	16	To quote	
		To bid in auctions	
		To report	

Public debt management and open market operations in Brazil

Luiz Fernando Figueiredo, Pedro Fachada and Sérgio Goldenstein[1]

1. Public debt management

An inflation targeting regime was introduced in Brazil in 1999, following a largely unexpected move from a fixed to a floating exchange rate regime; see Fraga (1999) and Fachada (2001). Supporting this new policy framework, the treasury and the central bank announced a series of guidelines regarding the management of their domestic debt. These included lengthening the average maturity of the debt, increasing the share of fixed rate securities in total debt outstanding and reducing simultaneously the share of dollar and overnight rate-linked securities, and fostering the secondary market for public debt.

The most important measures implemented under these guidelines were to:

- concentrate maturities using reofferings;
- hold auctions of long-term fixed income securities after presentation of firm bids by financial institutions;
- repurchase government securities through regular auctions by the National Treasury;
- allow separate trading of principal and coupons (strips);
- allow financial institutions to hold short positions in government securities;
- develop a registration system for forward operations with government securities;
- make flexible leverage limits for financial institutions in operations with government securities;
- change the selection process for central bank primary dealers in order to stimulate their market-making ability;
- enhance transparency through monthly press releases on public debt and open market operations;
- increase predictability through an advanced release of monthly auctions schedules;
- introduce electronic trading of government securities; and
- organise periodic meetings between the central bank, the treasury and primary dealers.

Backed by a sound fiscal policy, these guidelines for domestic debt have produced satisfactory results. The average maturity of domestic debt lengthened to 35 months in November 2001 from 27 in December 1999 (Graph 1). In the same period, the share of short-term (less than one-year) securities in the total outstanding declined to 26% from 53% (Graph 2). The liquidity in the secondary market has been increasing, albeit at a slow pace, but further improvement is expected to occur with the introduction in April 2002 of a new payments system, which has been designed to mitigate systemic risk. Finally, enhanced transparency has helped to lower financing costs for the Treasury and has allowed financial institutions to increase their exposure to government securities.

Nevertheless, the macroeconomic environment deteriorated in 2001 due to a diversity of adverse shocks suffered by the Brazilian economy – political turmoil and debt default in neighbouring

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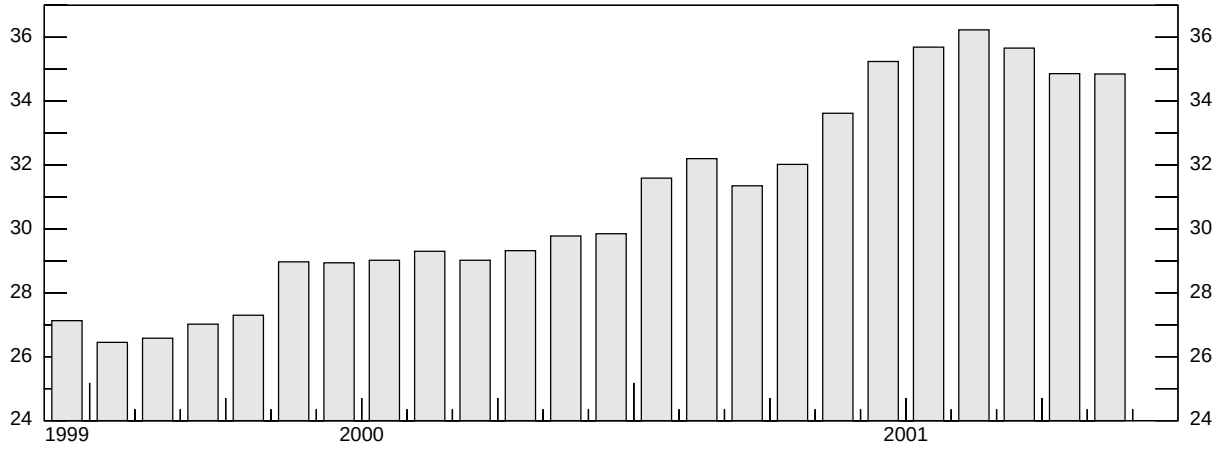
Argentina, slowdown of world economy, the 11 September events, fall in capital flows and a domestic energy shortage that led the government to implement a severe rationing programme. These shocks forced an upward move in the slope of the domestic yield curve. The Treasury therefore faced a trade-off between lengthening the average maturity of the debt or increasing the share of fixed rate securities. The first option was chosen. Simultaneously, the central bank increased the issuance of dollar-indexed securities in order to contain the exchange rate overshooting. As a result, the share of fixed rate bonds returned to 8% in November 2001 (below the initial level of December 1999) after growing to 15% in December 2000. As for dollar-indexed securities, the share in public debt outstanding peaked in October (33%) from 22% in December 2000 (Graph 3), due not only to the net issuance of bonds but also to the exchange rate depreciation in the period.

Graph 1

Average maturity of public debt outstanding

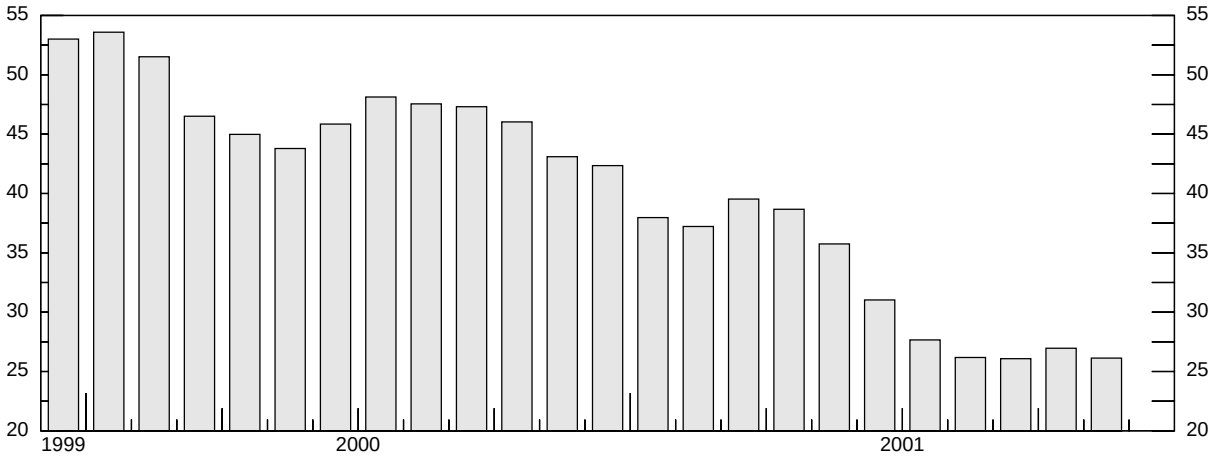
In months



Graph 2

Short-term debt

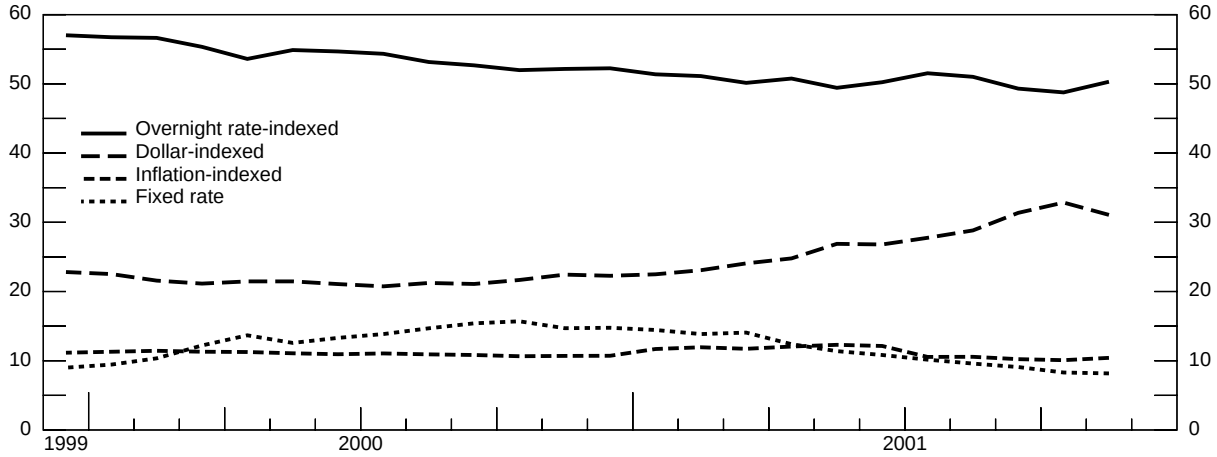
As a percentage of total debt outstanding



Graph 3

Composition of public debt outstanding

As a percentage of the total



The currency depreciation, the increase in real interest rates and the decline in GDP growth in 2001 led to domestic public debt outstanding rising to more than 51% of GDP around September-October 2001, from 45% in December 2000. (However, about half of the rise was attributable to a transfer of bad assets from state-owned banks to the Treasury.) The subsequent exchange rate appreciation has already reduced the domestic value of outstanding debt, with the year-end exchange rate below the average issuance rate of BRL 2.44 per dollar for the whole year.

External debt management will be a responsibility of the Central Bank until 2003. The objectives have been to build up yield curves for sovereign bonds in different currencies (US dollar, euro and yen), to establish a benchmark for private sector bond placements, and to raise funds at appropriate costs and risk levels. Despite the deterioration in the external economic environment in 2001, the market remained open to Brazil's sovereign issues, and the country raised a total of US$ 6.8 billion at reasonable spreads. The external debt profile continued to improve, and the share of external debt maturing within one year fell to 8% in June 2001 from 17% in December 1999, while the average maturity lengthened to 9½ years from below 8 years over the same period.

2. Open market operations

Brazil, like most countries adopting an inflation targeting framework for monetary policy, uses the overnight interest rate as the instrument for conducting monetary policy. The Monetary Policy Committee, therefore, sets the target for the overnight-Selic rate in its monthly meetings, and under the Committee's directives the open market trading desk adjusts market liquidity on a daily basis to maintain the effective overnight interest rate close to the target.

Open market operations are the main instrument for liquidity adjustment in the system. Standing facilities are not used to balance supply and demand for bank reserves. The demand for bank reserves is determined by reserve requirements on demand deposits, which, despite substantial reduction in the last two years (from 75% to 45%), are still high by international standards. On the supply side of bank reserves, factors affecting them are the usual: (i) currency held by the public; (ii) the central bank's operations in the foreign exchange market; (iii) tax revenue, government spending and budgetary endowments; (iv) placing and redemption of government securities; (v) discount window facilities; (vi) reserve requirement adjustments; and (vii) open market operations.

The Central Bank has been operating its open market desk through repurchase agreements, using as collateral national treasury and central bank securities. Outright operations are less frequent, as, depending on the volumes traded, they can cause volatility in bonds prices, and hence in the yield curve. On a daily basis, the central bank forecasts the market's liquidity needs, that is, it estimates whether there is shortage or excess of bank reserves, and carries out an informal auction aimed at

balancing liquidity. Repo tenures usually vary from one to three days, and government securities are priced below market prices (with a haircut) to protect the lender against credit risk.

The Central Bank carries out open market operations directly with 25 primary dealers, selected twice a year among the more active institutions in the financial system. These dealers act as an interface with other market participants, and are chosen according to performance criteria, including each institution's performance in the primary and secondary markets for government bonds. As noted, open market operations are conducted only through primary dealers, but, unlike in other countries, all financial institutions can participate in the primary offerings of government securities, not just the primary dealers.

Participation in auctions is restricted to financial institutions keeping an account in the Sistema Especial de Liquidação e de Custódia (Selic), which is an electronic book-entry system that controls the custody of and registers all operations regarding domestic government securities. The two parties (buyer and seller) must input every transaction into Selic and the system makes a two-sided matching of their orders. The seller's position in securities and the buyer's position in bank reserves are checked. The transaction is settled on a DvP basis, if and only if securities and cash are immediately available.

Electronic trading received a major impulse with the implementation in August 2000 of Sisbex – Trading System of Public Bonds and other Assets – by the Rio de Janeiro Stock Exchange. In the second half of 2001, Sisbex accounted for around 20% of government securities market turnover, surpassing 30% in the November-December period.

Currently, the most heavily traded bonds issued by the Treasury are the Nota do Tesouro Nacional - série D (NTN-D) indexed to the BRL/dollar exchange rate, the Letra Financeira do Tesouro (LFT) indexed to the Selic rate, and the Letra do Tesouro Nacional (LTN), a discount bond. The central bank, on the other hand, issues only the Nota do Banco Central - série E (NBCE), which has similar features to the NTN-D. More recently, the Central Bank interrupted their issue, anticipating a requirement of the Fiscal Responsibility Law, which prohibited the central bank from issuing its own bonds after May 2002.

Since August 2001, the shortage of bank reserves has been increasing because of the following factors: (i) the net selling of government securities, in particular those dollar-indexed; (ii) the policy of daily sales of foreign exchange reserves by the central bank in the spot market; and (iii) the primary surpluses of the public sector. In December 2001, this shortage exceeded BRL 20 billion. As the initiative on whether or not to provide bank reserves through open market operations rests with the central bank, though there is a presumption that this would be the case, the shortage of reserves in the system facilitates the conduct of a tight monetary policy.

3. Policy issues for the medium term

An important institutional reform is the project to restructure the payment system, which was fully implemented in April 2002. The main concern is to reduce systemic risk and to transfer credit risk from the central bank to the private sector. The new payment system has been designed by adopting internationally accepted standards and practices, including:

- a clear definition of the role of the central bank in the payment system and establishment of a well founded legal basis to allow better risk control devices;
- a large-value funds transfer system at the central bank operating on an RTGS basis and the monitoring of bank reserves in real time;
- clearing houses to ensure certainty of settlement through proper safeguard mechanisms; and
- a clear definition of all the risks involved in every stage of the pre-settlement and settlement process.

Other initiatives aimed at strengthening the financial sector include stimulating market-making activity among market participants, modernising insolvency procedures for banks, introducing a new bankruptcy law, and restructuring the housing credit system.

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Capital markets in Chile: from financial repression to financial deepening

Rodrigo Cifuentes, Jorge Desormeaux and Claudio González[1]

1. The evolution of capital markets in Chile

Milestones in the institutional development of capital markets

Between 1975 and 1981 the Chilean financial system experienced a significant expansion, as a result of a liberalisation process that put an end to 30 years of financial repression.[2] This process was an integral part of a broad series of structural reforms introduced in Chile since the 1970s, including reforms of the trade regime, the social security system, the regulation of basic utilities, labour market legislation, social services and the privatisation of state-owned enterprises.[3]

However, the liberalisation of interest rates and the lifting of credit controls in 1974 and 1975 was not coordinated with the additional supervision capabilities required in a deregulated capital market. This weakness in regulatory institutions was the result of the "free banking" model favoured by the economic authorities at the time. When the 1982-83 recession ensued, the absence of a system of prudential regulation led commercial banks to exploit the de facto deposit insurance present in the system.[4] This gave rise to a severe financial crisis, in which almost all financial intermediaries were either liquidated or intervened. As a result, the consensus among policymakers shifted in the direction of introducing a system of prudential regulation.

In the early 1980s the country embarked on a second generation of reforms, significantly increasing the powers of supervision and control of the Superintendency of Banks and Financial Institutions (SBFI). In August 1981 the powers of the SBFI were enhanced to sanction institutions that threatened financial stability, particularly through connected lending practices (making loans to companies associated with the shareholders of the lending bank). These directives were, however, quickly evaded by the largest business groups, and connected lending continued until 1983.[5]

The most important regulatory reform took place in November 1986, when a new General Banking Law was enacted. By then, the Chilean financial markets – both agents and regulators – had accumulated significant experience about the operation of free capital markets. This learning process led to a more sober attitude on the part of borrowers, and a more effective evaluation of risk by regulators and financial institutions.

The reforms also modernised the non-banking areas of the financial system. A new pension system was created in 1980, when the existing state-operated pay-as-you-go system was replaced by a fully funded system with private provision.[6] A new Superintendency of Securities and Insurance (SSI) was created in 1980, with the objective of regulating issuers and traders of these instruments, including stock exchanges and insurance companies. The Securities Market Law of October 1981 opened the brokerage of securities to competition, allowed for the existence of securities dealers (Agencias de Valores) and modernised the regulations governing mutual funds.

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2 De la Cuadra and Valdés (1992b), p 73.

3 Corbo (1985), Corbo and De Melo (1987) and Corbo and Fischer (1994, 1995).

4 De la Cuadra and Valdés (1992a) and Velasco (1991)

5 De la Cuadra and Valdés (1992b).

6 Diamond and Valdés-Prieto (1994), Valdés and Cifuentes (1990), Valdés-Prieto (1997) and Wagner (1983, 1991).

In October 1987, the Insurance Law and the Securities Market Law were modified to require all instruments eligible for investment by private pension funds to have a risk rating from two specialised private agencies. A parallel evaluation was conducted by the Risk Rating Commission established by the Private Pensions Law within the Superintendency of Pension Fund Managing Companies. This was a key step that allowed the development of a risk rating industry and the production of relevant information about the solvency of different instruments.

Another comprehensive modernisation of capital markets legislation took place in 1994 and 1995, when the Private Pensions Law, the Securities Market Law, and Mutual Fund and Insurance Company legislation were reformed to liberalise pension fund portfolio limits, improve regulations and add securitised assets and large infrastructure projects to the list of eligible instruments for pension fund investment.

The state of Chilean capital markets: 1980-85

Table 1 describes the major characteristics of the structure and development of the Chilean capital markets between 1980 and 2000. Stock transactions (column 1) decreased markedly between 1980 and 1985, both as a percentage of GDP and in US dollar terms. This was a direct consequence of the economic and financial crisis experienced by Chile in 1982-83, whose effects extended until 1985. Fixed income transactions (column 2) increased as a percentage of GDP between 1980 and 1985 despite the recession. This is closely related to the development of the new private pension system (column 6), which initially invested a significant proportion of its portfolio in fixed income securities. The growth of insurance company reserves (column 5) between 1980 and 1985 is also related to the development of the new pension system, which mandates that the risk of disability and death of every worker must be covered.

Chilean financial markets experienced a severe crisis in the mid-1980s, when a good part of the banking system, including the two largest banks, were taken over by the government. Terms of trade were depressed, and foreign credit very scarce, due to the high risk premium charged by creditors to a heavily indebted country such as Chile.

Financial deepening: 1986-95

From 1986, the external environment faced by Chile improved, and the structural adjustment policies adopted in 1985 started to bear fruit. As a result, Chile embarked on perhaps the longest period of sustained growth in its history, averaging 7.7% per year between 1985 and 1995. Not surprisingly, the Chilean capital market grew remarkably in size, depth and liquidity: stock transactions grew faster than GDP, from a little more than 2% of GDP in 1980, to 18% of GDP in 1995 (column 1). Fixed income transactions and financial intermediation (commercial paper and other short term securities) grew remarkably as well; the former reached 129% of GDP in 1995, while the latter approached 95% of GDP in the same year (columns 2 and 3). Stock market asset valuation increased from 42% of GDP in 1980, its previous peak, to 112% of GDP in 1995 (column 4). Asset values grew at an average rate of 56% per year between 1985 and 1995. This striking expansion, which cannot be explained by economic growth alone, is related to two developments: the growing volume of funds managed by institutional investors, and foreign capital inflows.

Pension funds increased their share of GDP from 11% in 1985 to 40% in 1995, while insurance company reserves rose from 3% of GDP to 10% in the same period (columns 6 and 5). When the pension system enters its steady state, the accumulated funds will approach the size of GDP. Insurance companies will also benefit from selling annuities to retiring workers, who will use the funds accumulated in their individual capitalisation accounts for this purpose. Because pension fund and life insurance companies tend to favour long-term instruments, these institutional investors are generating a considerable demand for this type of financial asset.

Mutual funds, foreign investment funds and corporate bonds also increased their share of GDP from negligible values in 1985 to 3-4% of GDP in 1995 (columns 7, 8 and 9).

Finally, the most comprehensive indicator of financial depth is the aggregate M7-M1. This is defined as total financial instruments (all types of deposits plus treasury and central bank instruments and mortgage-backed securities) less liquid money (currency and demand deposits). As shown in Table 1, it increased from 38% of GDP in 1985 to 65% of GDP in 1995 (column 10).

Table 1

Structure and development of the capital market in Chile

(as % to GDP)

	Annual turnover			Equity market capitali-sation	Institutional investors				Corp-orate bonds	M7-M1
	Stocks	Bonds[1]	Financial inter-mediation		Insurance company reserves	Pension funds	Mutual funds	Foreign invest-ment funds		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1980	2.4	0.3	3.3	41.9	2.0	...	2.7	.	0.2	...
1981	1.4	0.4	5.5	26.6	1.9	1.2	2.6	.	0.4	27.7
1982	0.6	3.3	10.4	21.6	2.3	3.5	2.4	.	1.7	32.2
1983	0.3	5.7	3.2	13.1	2.6	6.4	0.6	.	1.5	31.1
1984	0.2	4.4	2.9	11.4	2.9	7.6	0.5	.	1.4	31.1
1985	0.3	10.6	9.2	13.1	3.4	10.6	0.8	.	1.5	37.9
1986	1.7	24.3	16.5	22.9	3.9	12.7	1.2	.	0.9	39.6
1987	2.4	26.2	24.6	25.4	4.4	14.2	1.4	.	1.4	43.0
1988	2.5	34.1	40.1	27.5	4.4	15.0	1.4	.	2.0	42.1
1989	3.0	42.5	32.6	33.2	5.2	17.7	1.3	0.4	3.4	49.5
1990	2.5	45.5	17.3	43.7	6.7	24.2	1.6	1.7	4.6	58.9
1991	5.5	35.2	27.1	81.6	7.9	31.4	2.6	3.0	5.6	61.2
1992	4.8	53.2	39.2	69.6	8.2	30.6	2.3	2.7	4.9	61.7
1993	6.1	55.9	61.3	73.2	9.7	37.0	2.9	3.6	4.8	62.6
1994	10.1	89.0	63.3	124.8	8.7	41.0	3.9	3.9	4.5	62.6
1995	17.5	128.5	95.0	112.0	9.9	39.5	4.0	3.1	3.5	65.4
1996	11.7	119.0	167.3	99.0	11.5	40.9	4.2	2.1	3.1	72.8
1997	10.2	121.2	193.7	100.1	12.4	42.5	5.3	1.9	2.5	79.2
1998	6.2	127.4	273.2	73.0	13.4	43.3	3.8	1.2	3.0	81.3
1999	10.2	72.9	199.1	105.0	15.2	52.6	5.6	1.6	3.7	87.1
2000	8.9	64.5	191.8	91.7	16.7	53.9	6.8	1.0	5.3	87.5

[1] Fixed income securities; government, mortgage, leasing, bank and corporate bonds.

Sources: Arrau (1996); (1) to (4) Santiago Stock Exchange; (5) (7) (9) Superintendency of Securities and Insurance; (6) Pension Fund Superintendency; (10) Central Bank of Chile.

The extraordinary expansion between 1986 and 1995 led Arrau (1996) to claim that the Chilean capital market had become the most developed in Latin America, and perhaps among all developing countries. The private pension system was at the root of this important transformation, which greatly influenced the rest of the financial system. In 1995, the banking system was considered the healthiest and most competitive in Latin America, while other institutions, such as stock markets, financial intermediaries and institutional investors, have all showed a remarkable expansion since the mid-1980s.

A trend towards illiquidity and concentration: 1995-2000

However, the extraordinary performance of the Chilean capital market was interrupted in 1995. In 1996 stock market transactions dropped to 12% of GDP and have not recovered their pre-1995 levels since (column 1). Fixed income transactions (column 2) increased as a percentage of GDP between 1995 and 1998, but fell in 2000 to half their previous peak.

Pension funds, on the other hand, have continued to increase their share of GDP, from 40% in 1985 to 54% in 2000 (column 6). Thus, there was no reversion in pension fund investments between 1995 and 2000. The same pattern applies to insurance company reserves (column 5), which continued to grow as a percentage of GDP between 1995 and 2000. This was undoubtedly related to the maturity of the new pension system, as workers purchase annuities at the end of their active life. Mutual funds also increased their share of GDP between 1995 and 2000, from 4% to 7% (column 7). This stood in stark contrast with the evolution of stock and bond transactions, however.

Corporate bonds issued in the domestic market decreased from 3.5% of GDP in 1995 to 2.5% in 1997, and then recovered to 5.3% in 2000, their second highest level in history (column 9). The evolution of this market is analysed in more detail in Section 4.

Foreign investment funds, which have operated in Chile since 1989, experienced a reduction in size as a proportion of GDP, from a peak of 3.9% in 1994 to less than 1.0% in 2000 (column 8). This is explained by the placement of American depository receipts (ADRs) in the New York Stock Exchange by Chilean corporations, which reduced the demand for foreign investment funds, and the sub-par performance of the Chilean stock market since 1995, which led to the liquidation of several of them.

Finally, the index of financial depth, the monetary aggregate (M7-M1) in column 10, shows consistent growth throughout this period. This suggests that the total pool of savings in Chile has increased systematically in the last five years.

How can we reconcile the continued growth of savings with the significant reduction in stock and bond transactions as well as in stock valuations since 1995?

Stock market liquidity

It is interesting to note that this reduction in liquidity levels developed before the emergence of the Asian crisis, while capital flows were still abundant and the economy was growing at very high rates. More significantly, this trend towards lower market liquidity was not apparent in other emerging markets, with the exception of Mexico and Peru.[7]

One of the most important explanations for this “liquidity puzzle” is related to the application of taxes on the secondary issuance of ADRs in 1995, which seriously affected financial integration, and dried up liquidity in domestic markets. During the 1990s the combination of a semi-fixed exchange rate regime and decreasing sovereign risk reduced the effectiveness of monetary policy, and forced the monetary authority to impose taxes on capital inflows to regain monetary independence. As controls on short-term capital flows proved ineffective, the authorities extended these taxes to the secondary issuance of ADRs, which severely affected market arbitrage and liquidity. This factor must have played a significant role between 1995 and 1998, when these taxes were in place, but is no longer a factor today. Moreover, in September 1999 the central bank opted for a free float and then eliminated all controls on capital flows in April 2001.

A second explanation claims that domestic financial markets are overregulated, particularly in the case of pension funds, which has hampered innovation and creativity, and stimulated rent-seeking behaviour. Closely related to this argument is the role of taxation: high marginal income tax rates and capital gains taxes create a bias against the domestic stock market in the case of individuals and foreign residents. Section 3 discusses the way in which many of these issues have been addressed in the recent reform of capital markets legislation.

A third explanation is related to the structure of the market itself. The Bolsa de Comercio de Santiago trades almost exclusively stocks from large corporations. Small and medium-sized companies have little interest in listing their stock because of high costs and stringent regulations on pension fund investments. Thus, as large corporations issued ADRs on the New York Stock Exchange, transactions tended to shift to that market. The imposition of taxes on the secondary issuance of ADRs in 1995 accelerated this trend. Reforms to reduce the cost of listing small and medium-sized companies will stabilise liquidity in the domestic market. In Section 3 we describe how this problem has been addressed in the recent reform of legislation governing capital markets.

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[7] Table 1 in Arrau (2001).

Another structural factor that impairs liquidity is that the domestic stock market is a poor representation of the economy's GDP. For example, the mining sector has a minimal representation, despite being a significant sector in the economy. On the other hand, power generation and distribution, telecommunications, and the forestry sector account for 50% of stock market valuation, but represent less than 15% of GDP.

Various authors emphasise that the "liquidity puzzle" is also related to the increased concentration of the pension fund industry, which has created a virtual monopsony among institutional investors, because of the small relative size of mutual funds and investment funds.[8] The trend toward concentration is also taking place among stock issuers, as a result of a series of mergers among large corporations. Thus, both the supply of and the demand for stocks have become more concentrated, thereby reducing transaction levels.

While these explanations are valid, we believe that they are only part of the story. Chile's exceptionally high growth rates between 1985 and 1997 were the result of two key ingredients: a significant increase in productivity, and benevolent external conditions (a dynamic world economy, favourable terms of trade, and moderate international interest rates). After the mid-1990s, the Chilean economy slowed down its reform effort, which affected productivity growth and expected returns. The economy continued to grow at high rates until 1997, however, as a result of large capital inflows, but stock market valuations and liquidity levels were already trending down in 1996. Controls on capital flows, overregulation, concentration, and other industry-specific factors added to this outcome. The recent reform of capital markets legislation outlined in Section 3, together with the elimination of restrictions on capital flows, will surely have a significant impact on stock market valuation and liquidity. But to ensure a lasting recovery of our financial markets will also require an acceleration of productivity growth and an improvement in external conditions.

Liquidity in the fixed income market

The evolution of liquidity in the fixed income market differs from that in the stock market, and has its own determinants. In particular, developments in this market have been less dependent on international developments than in the case of the stock market.

Before going into more detail, it is important to note that transactions in this market have been dominated by bonds from the public sector.[9] Graph 1 shows that this primacy declined throughout the decade, however. Indeed, while public sector bonds represented 80-85% of transactions at the beginning of the 1990s, at the end of the decade their share was down to 50%. Graph 1 shows that the counterpart of this decline is the growth in transactions of mortgage-backed securities and corporate bonds. Each of these represented about 4% of transactions at the beginning of the decade, and reached 20-25% of the market in 2001. Their evolution across the decade, though, has been markedly different, with mortgaged-backed securities experiencing the largest increase in transactions until 1998. Since then, the most dynamic component has been the corporate bond sector, which shows a remarkable rise in transactions between 1999 and 2001.

Column 2 of Table 1 shows two distinct episodes in the evolution of transactions in this market during the 1990s, the period 1995-98 and the period 1998-2000. In the first period, transactions reached a peak in 1995 and stabilised around that level. During the second episode (1998-2000), transactions halved as a percentage to GDP.[10] Both facts can be explained by very specific developments in the Chilean market.

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[8] Círculo de Finanzas de ICARE (1998).

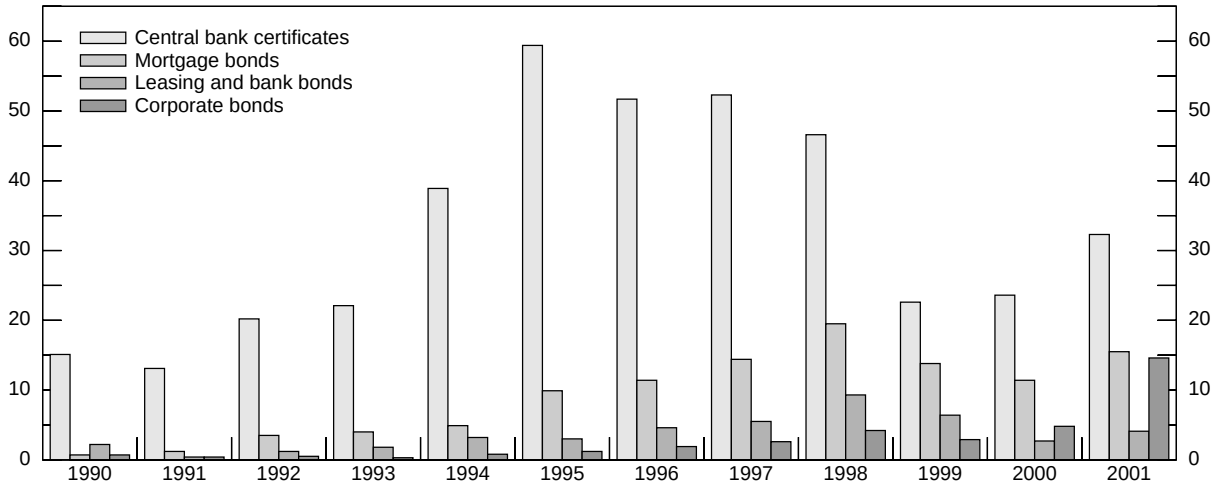
[9] In Section 2 it is explained that public sector bonds traded domestically are exclusively central bank bonds.

[10] The data in Table 1 refer to the Santiago Stock Exchange only. The Electronic Stock Exchange trades a similar volume. As trading on both exchanges shows similar patterns over the period covered, including it would not change the conclusions.

Graph 1

Transactions in fixed income markets

On the Santiago Stock Exchange; in billions of December 2000 US dollars



Note: Data for 2001 are projections based on January-October data.

During the first episode, transaction levels are closely related to an increase in concentration in the pension fund industry, which commenced in the mid-1990s. The number of pension funds rose from 14 in 1990 to 21 in 1994. Thereafter, a wave of mergers took place in the industry, bringing the number of funds down to eight in 1998. This affected transactions in the fixed income market for two reasons. The first is that pension funds are major holders of public sector (ie central bank) bonds. Approximately 70-75% of long-term bonds are held by pension funds. Since these bonds are, in turn, the most traded bonds in the fixed income market, it follows that an increase in concentration in the pension funds industry will translate into a lower level of transactions in this market. The second reason is that pension funds are obliged by law to conduct their secondary market transactions through public auction on an organised exchange. Therefore, the reduction in transactions between pension funds is fully reflected in measures of turnover. Graph 2 shows the Herfindahl Index, which measures concentration in the pension fund and banking industry.[11] Both show an increase in concentration starting in 1995, which is more pronounced in the case of pension funds.

Graph 1 shows the evolution of transactions for different fixed income instruments. We note that transactions of public sector bonds show a marked change of trend in 1995, which is not apparent in the case of other instruments. Transactions in other bond categories increase, particularly in the case of mortgage-backed securities. Banks and insurance companies hold a higher fraction of these securities, and concentration among them was milder.

The second episode starts with an important event that took place in 1998. During that year the Chilean peso faced significant pressure as a consequence of an unstable international context. This forced the central bank to increase interest rates sharply. In September 1998, the 90-day real interest rate reached a level of 17.6%. Long-term rates followed suit. The benchmark eight-year indexed bond rate increased by more than 100 basis points in the same month.

The resulting price changes brought significant capital losses to holders of fixed income instruments, who started to invest more cautiously, giving rise to a sharp reduction in transactions. The impact on transactions of corporate bonds was somewhat milder (see Section 4).

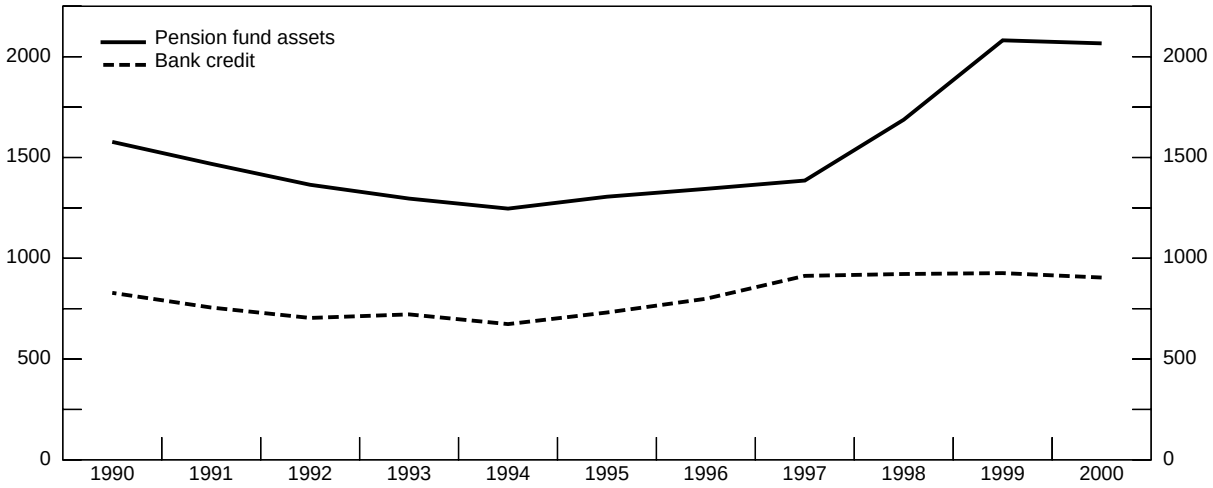
Graph 1 shows that the recovery in transaction levels in 2001 was fast, which confirms that the reduction that took place between 1998 and 2000 was of a transitory nature.

[11] The Herfindhal Index measures concentration as the sum of the squares of market shares, ie $\sum_{\forall i} (x_i / Total\ X)^2$ x 1000. A usual rule of thumb is to consider that concentration is high when this index is above 1,000.

Graph 2

Concentration in pension funds and banking sector

Herfindahl Index



2. Public sector balance and public debt instruments

The Chilean economy has a long history of public sector surpluses. The public sector balance has remained positive since 1986, with the sole exception of 1999, when a deficit of 1.5% of GDP was recorded. Due to this history of surpluses, the government has seldom issued debt instruments in the local market to finance its expenditures. However, the government issued bonds in international markets with the purpose of establishing a sovereign risk benchmark, in order to facilitate the placement of private sector debt in these markets. Thus, the government issued a US$ 500 million bond in 2000 and a US$ 650 million bond in September 2001.

When considering the issuance of debt instruments by the Chilean public sector, it is important to note the liabilities originated as a result of the pension system reform of 1980. Workers who chose to join the new system were issued a "recognition bond", a zero coupon instrument that represents the contribution of the worker to the old pay-as-you-go system.[12] This bond is included in the worker's capitalisation account and is redeemed at retirement.

The central bank is currently the largest issuer of public sector bonds in the local market. These are used as a mechanism to regulate the monetary base through open market operations, and to determine a benchmark yield curve for the economy. Debt instruments issued by the central bank have short- and long-term maturities, and they are denominated in local (both nominal and CPI-linked) as well in foreign currency. The main characteristics of the instruments issued by the central bank are shown in Table 2 below.

Central Bank bonds are issued through periodic tenders. In the case of long-term bonds, issuance is predetermined; in the case of short-term bonds, auctions are held on set days, but the size of the amount issued monthly per instrument is announced at the beginning of each reserve requirement period.[13]

[12] New entrants to the labour market after 1980 have been able to opt for the new private pension system.

[13] The reserve requirement period in Chile goes from the ninth day of the month to the eighth day of the next month.

Table 2

Debt instruments issued by the Central Bank of Chile

Type of instrument	Characteristics	Average volume offered per auction	Frequency
Short-term debt			
PDBC	Local currency Maturity: 30, 60, 90 and 360 days No coupons	30 days: $190m 60,90 and 360 days: $16m	90 and 360 days: weekly 30 and 60 days: irregular
PRBC	Local currency indexed to UF[1] 360 days No coupons	$24m	Weekly (previously quarterly)
Long-term debt			
PRC	Local currency indexed to UF[1] Maturity: 8 and 20 years (previously also 10, 12 and 14 years) Semi-annual coupons of interest and capital	8 years: $19.2m 20 years $ 9.6m	Bi-weekly
PTF	Local currency indexed to UF Maturity: 1-15 years Semi-annual coupons Floating rate interest (percentage of average interest rate disclosed by central bank)		No longer issued, but some still outstanding
PRD	Local currency indexed to US dollar Maturity: 2, 3 and 4 years Semi-annual interest payments and capital at maturity	$88m Maturities alternate	Twice weekly
Zero	Coupons stripped out from PRD		Traded upon request
Cero	Coupons stripped out from PRC		Traded upon request

[1] UF is a unit of account used for inflation-adjusted instruments, whose daily value is published by the central bank.

Bonds issued by the central bank are placed directly through a public auction in which banks and institutional investors – such as pension funds and insurance companies – can participate. These agents have provided a stable demand base, and therefore it has not been necessary to create primary dealers. They cannot be considered market-makers either, since they do not have any obligations related to secondary market transactions.

3. Recent reforms in legislation governing capital markets

In order to overcome many of the limitations described in Section 1, particularly at the regulatory level, the government and the financial industry agreed on the need for a "second phase of reforms".[14] The aim was to develop a strategy of market deregulation, which would eventually lead to a financial "big-

[14] Arrau (2001) summarises the main requests of the finance industry.

bang" similar to that experienced by more developed markets such as Australia, New Zealand, United Kingdom, France, Spain and Japan in the 1980s.

Since the end of 2000, the government has enacted two laws to stimulate the development of domestic capital markets: the IPO Law and the recent Reform of Capital Markets Law.

The IPO Law

The new legislation regulating initial public offerings (IPOs), enacted at the end of 2000, has eight objectives:

- to improve the framework for the acquisition of corporate stock in order to protect the rights of minority shareholders;
- to establish rules for corporate governance within the companies to protect the rights of minority shareholders and achieve a degree of self-regulation;
- to provide more flexibility to investment funds in the management of their funds;
- to regulate the participation of pension funds in the IPO process;
- to strengthen the regulatory powers of the Superintendency of Securities and Insurance;
- to establish additional capital requirements for banks with high concentration as a safeguard against systemic risk;
- to modify the Central Bank Organic Law, requiring the central bank to conduct an IPO process to dispose of the stock of commercial banks that it owns; and
- to allow the mechanism of stock-options in corporations.

In sum, this legislation seeks to avoid private transactions that may be unfair to minority shareholders. This should have a positive impact on market liquidity, as new agents take steps to enter the stock market.

Reform of capital markets legislation

The Reform of Capital Markets Law enacted in 2001 aims to improve the liquidity and depth of financial markets and facilitate the access to capital markets of emerging companies. The reform focuses on the following areas:

- *Greater flexibility to access capital markets for small and medium-sized companies*. The reform establishes a new stock market for emerging companies and eliminates taxes on capital gains for these companies; it introduces the possibility of issuing commercial paper for short-term financing, limiting the application of stamp taxes on the companies; it reduces capital gains taxes for foreign investors; and it creates the category of "qualified investor".
- *More liquidity and depth in capital markets*. The reform eliminates the tax on capital gains for high-turnover stocks and for short sales of bonds and stocks. It regulates the private placement of securities, in which only "qualified investors" (including institutional investors) can participate. It opens the management of funds arising from voluntary savings to other institutions besides pension fund management companies. Portfolio limits for insurance companies, mutual funds and investment funds are more flexible. Certain requirements for companies to become eligible for pension fund investment are eliminated.
- *Greater competitiveness for the banking industry at local and international level*. The reform introduces more flexibility for banking regulatory capital and eliminates the 4% tax on interest from external credit, when the purpose of such credit is cross-border financial intermediation.

These two sets of legislation are expected to improve market liquidity and the access to funds by small and medium-sized companies. For example, the creation of a new stock exchange for emerging companies is expected to increase the number of companies listed, as has been observed in developed countries that have set up this kind of institution. Transactions of high-turnover stocks conducted at this institution will be exempt from the capital gains tax for three years, provided that the purchase and sale of the stock take place on the stock exchange. Private placement of securities, in

which only qualified investors may take place, is allowed. This will give rise to specialised investors in the domestic capital market, particularly on the stock exchange.

These reforms also relax restrictions on institutional investors, allowing insurance companies to compete on equal terms with pension funds. This will increase competition in the local market for outstanding instruments and set up a better framework for developing new instruments in the future.

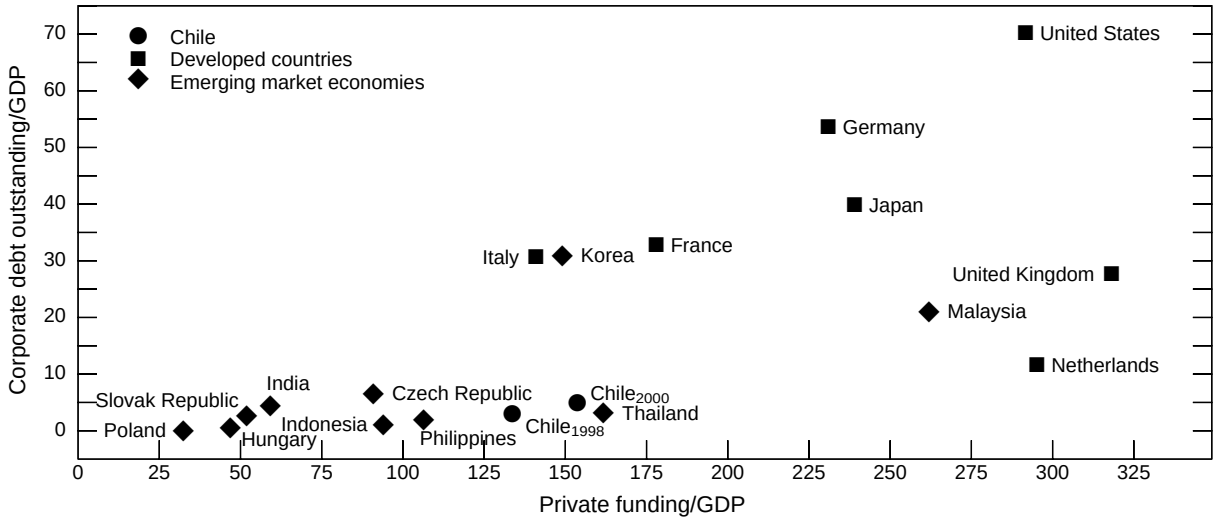
4. The market for private debt in Chile

The market for corporate bonds: an international perspective

Currently, outstanding corporate debt in Chile amounts to 5% of GDP. In order to compare this figure internationally, we have to take into account the overall level of financial development of the country. Graph 3 compares the level of financial development of different countries (developed and emerging) and the level of corporate debt, both measured as a percentage of GDP. The overall level of financial development is measured as the sum of bank loans to the private sector, plus corporate debt and stock market capitalisation.

Graph 3

Financial development and corporate debt, 1998



Source: IMF and World Bank (2001).

The graph shows that countries differ substantially in the structure of their financial markets. While the Netherlands, United Kingdom and United States are among the most developed financial markets, they have substantially different levels of outstanding corporate debt. This shows that private debt does not necessarily come naturally as a consequence of financial development, but that it is a choice available to policymakers with regard to the type of financing system they want to promote.

In this comparison we can see that the current level of corporate debt issued in Chile is still low in relation to its overall level of financial development. Indeed, countries with similar levels of financial development (France, Italy, Korea) have a much larger corporate debt in relation to GDP. On the other hand, countries with similar levels of GDP, such as Malaysia, have higher corporate debt levels.

The advantages of developing private debt markets have been discussed in the literature.[15] Among them we can highlight the fact that private debt markets help to diversify risks in the economy, as firms

[15] Endo (2000), Herring and Chatusripitak (2000) and IMF and World Bank (2001).

become less dependent on the banking sector for financial intermediation. Private debt markets also endow financial products with flexibility to accommodate the specific needs of investors.

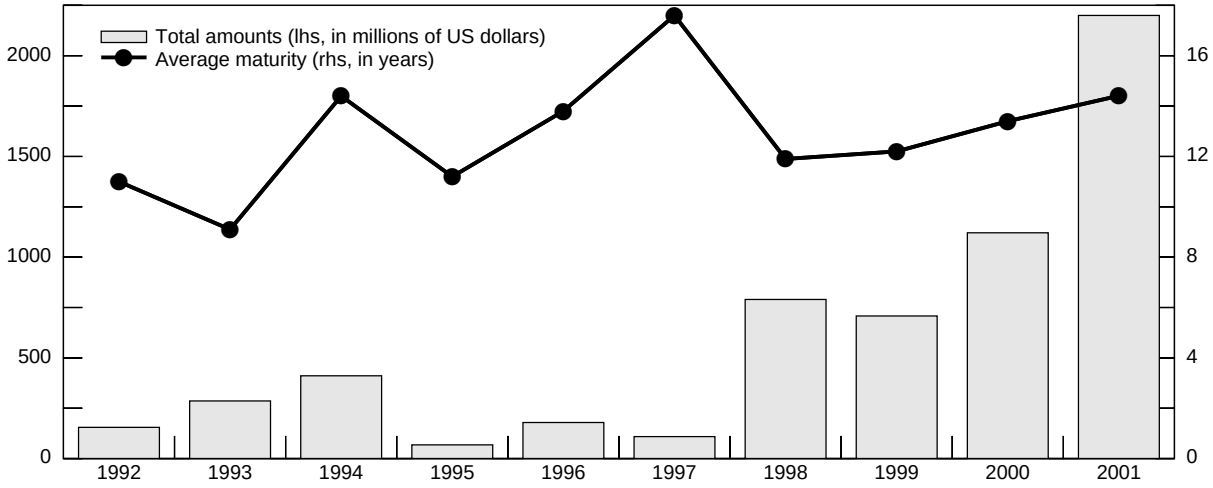
Evolution in the last 10 years: volumes issued, terms and liquidity

Volume and maturity of placements

In this section we describe the evolution of private debt since 1992. Graph 4 shows the evolution of volumes issued per year and the average maturity of these placements.

Graph 4

Corporate debt: annual placements



Source: Superintendency of Securities and Insurance.

Placements of corporate debt have increased substantially since 1998. Indeed, they are now more than double the previous peak. In the first 10 months of 2001 corporate debt placements exceeded US$ 2 billion, doubling the previous year's total. A gradual increase in maturity is also indicated in Graph 4.[16]

Additional facts about the evolution of corporate debt are depicted in Graph 5. This shows monthly data, with the average maturity of monthly issues on the vertical axis and the relative size of the markers ("bubbles") indicating the relative size of total monthly placements. Here we would like to highlight three facts:

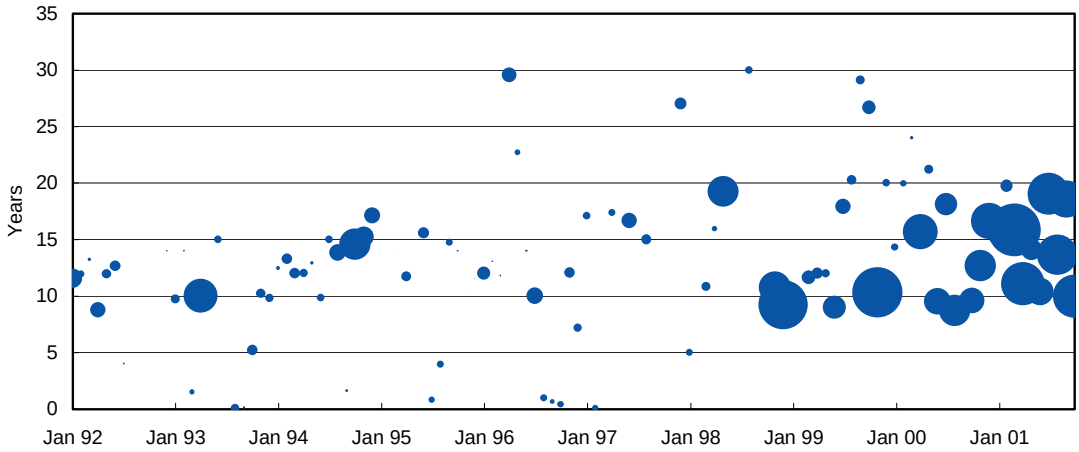
- Average maturity of placements between 1992 and 1995 was between 10 and 15 years. In the period 2000-01, the range of 15 to 20 years became more common. Moreover, placements with longer maturities have also been larger in recent years.
- Debt issues at terms shorter than a year disappeared by early 1997.
- As from 1996, 30-year corporate bonds started to become common.

[16] Average maturity also increased between 1995 and 1997, but this was because volumes were shrinking and longer maturities were among the survivors. The increase in average maturity between 1998 and 2001 is of a very different nature, because the amounts issued are now increasing.

Graph 5

Corporate debt: monthly placements

Total amount and average term



Source: Superintendency of Securities and Insurance.

Liquidity

With regard to liquidity, Table 3 shows information about transactions in the secondary market and the outstanding stock of corporate debt, as well as transactions in all fixed income securities traded in the secondary market. Column (4) reports the data behind the story depicted by Graph 1, which shows that a sharp decline in fixed income transactions has taken place since 1998.

The impact of the 1998 events was milder in the market for corporate bonds. While total transactions projected for 2001 are still below their 1998 peak, transactions in corporate bonds declined only for one year, and recovered in 2000 to a level exceeding that of 1998. For 2001, transactions of corporate bonds are projected at a level that is three times higher than that of 1998.

The turnover ratio reached an historical maximum for this market in 2001. Although still too low for it to be considered a “liquid” market by common standards, liquidity is higher than in the case of other markets, particularly central bank long-term bonds. The turnover ratio of the latter declined from 7 in 1994 to 1.7 in 2000. Column 5 shows that, measured as a fraction of total transactions, corporate bond transactions recorded a persistent growth from 5.5% in 1998 to 22.5% in 2001. This is a remarkable evolution.

The above indicates that the Chilean market has already incorporated corporate debt among its standard trading instruments. The reason for this is that corporate debt issuers have managed to create products that satisfy market demands not covered by the major issuer of public debt in Chile, namely the central bank. In particular, private issuers offer maturities not available in central bank issues.

As we see, the Chilean market has been expanding in terms of both the volumes it can absorb and the range of maturities it offers to private issuers. Two factors have been crucial to explain this development. On the one hand, the international context has made it more attractive to issue debt denominated in domestic currency. On the other, institutional investors have provided a stable base for demand, ready to accommodate the increased supply of local issuers.

With respect to the international context, until the mid-1990s the continuous appreciation of the peso and low external interest rates led corporations to favour external indebtedness. A reversal of this situation since 1998 has changed the preferences of local companies, which now favour the issuance of domestic debt. Most debt placed domestically in 2001 was issued to prepay debt denominated in foreign currency.

But at the same time, issuance of dollar-denominated debt has also risen within Chile, increasing the bias of issuers in favour of the local market. Despite a few placements of dollar-denominated debt in the early 1990s, this market only became relevant at the end of 1999, with the issue of a US$ 200 million bond by a mining company (Escondida). Other companies issued a similar amount thereafter.

Table 3

Secondary market transactions in Chile[1]

(millions of US dollars)

	Corporate bonds			Total fixed income securities transactions	(1)/(4)
	Transactions	Outstanding stock	Turnover		
	(1)	(2)	(3)	(4)	(5)
1990	723	1,698	0.4	18,661	3.9%
1991	461	2,270	0.2	15,099	3.1%
1992	477	2,262	0.2	25,289	1.9%
1993	347	2,369	0.1	28,241	1.2%
1994	854	2,431	0.4	47,917	1.8%
1995	1,260	2,225	0.6	73,530	1.7%
1996	1,906	2,092	0.9	69,513	2.7%
1997	2,708	1,677	1.6	74,817	3.6%
1998	4,353	2,048	2.1	79,627	5.5%
1999	2,971	2,544	1.2	45,520	6.5%
2000	4,927	3,738	1.3	42,483	11.6%
2001[2]	14,987	6,228	2.4	66,536	22.5%

[1] Transactions on Santiago Stock Exchange. [2] Annual projection based on data for January-October.

Source: Superintendency of Securities and Insurance.

It is interesting to note that dollar-denominated debt began to develop at the same time as the exchange rate regime in Chile moved towards a free float. In this context, different economic agents became more aware of the risks they faced from exchange rate fluctuations, and increased their demand for foreign denominated securities for hedging purposes.

Costs and some procedural issues make it easier for transactions to take place in the domestic market. According to local investment banks, the costs of placing debt in the domestic market are about one seventh of those of placing debt in foreign markets. The local market has the advantage of being open all year round, while placing debt in foreign markets requires a “window of opportunity”, ie a period of time in which market conditions are appropriate.

Institutional investors provide an important demand base. The pension reforms of the early 1980s therefore significantly affected the development of bond markets, through both direct investment in bonds by pension funds, and through the annuities that insurance companies sell to retirees under the new system. Insurance companies that offer such products are required by regulations to match the duration of their assets and liabilities. This implies that they are an important source of demand for securities with maturities of 20 or more years.

It is important to note that market agents have been able to adapt well to the changing conditions of the market. For example, in the face of increased concentration in the pension fund market, private issuers have reduced the terms offered in the short range of maturities from approximately 10 years to approximately five years. This has extended the demand for such instruments to banks, mutual funds and retail investors.

Infrastructure for development: what is behind and what is ahead of the bond markets in Chile

This subsection reviews the state of the “infrastructure” for the development of private debt markets, with emphasis on the role of regulation and the challenges ahead.

Government benchmark issues: the yield curve

The central bank is the main issuer of long-term public debt. Since the early 1990s, it has consistently been issuing debt at a range of maturities that goes from eight to 20 years. This has given the market a benchmark yield curve of significant length.

A feature of this debt is that it has equally sized semiannual coupons, ie coupons are not interest only, as all of them include some capital. This implies that determination of the yield curve is cumbersome, since the coupon effect has to be factored out. As a way of overcoming this type of problem and making bonds more attractive, the central bank has allowed bonds to be stripped since 1999. Transactions of these securities have provided a useful benchmark for the market.

Investor base: pension funds and insurance companies

As mentioned above, institutional investors are a crucial part of the demand for corporate debt. In Chile, the pension reform of the early 1980s was responsible both for creating a privately managed pension fund system of considerable size, and for increasing the demand for debt instruments from insurance companies.

Private pension funds have been around for 20 years now. One of the outcomes is an increase in the experience of the dealer community. This accumulated knowledge has been crucial for the growth of the corporate debt market.

On the other hand, investment regulations for private pension funds limit the risk that they can take in a bond. This has meant there is little room for companies and/or series with higher risk profiles. Along similar lines, investment limits favour public debt. While this implies a form of crowding-out of corporate debt by public sector debt, it is justified by credit risk considerations.

Recent developments in the derivatives market

Since 1999, banks have been allowed to participate broadly in interest rate derivatives for both holding and hedging purposes in the local market. Along with interest rate derivatives, the central bank also allows the short selling of securities in the case of the banking sector. This has enabled banks to enhance their portfolio management capabilities.

Currently, pension funds are also permitted to participate in the interest rate derivatives market, but for hedging purposes only. Pension funds can also lend central bank instruments that are part of their portfolio to other agents, with the purpose of facilitating the short selling of securities by banks and other agents. In this way, the portfolio of pension funds represents a strong base of instruments that can be used to deepen the domestic capital market.

The presence of the banking sector and pension funds in the market for interest rate derivatives has helped to enhance the liquidity of the debt market and is evidence of the development of the Chilean financial system. Although the authorisation for the banking sector to operate in derivatives in the local market is very recent, the depth of this market has increased remarkably in the last two years. An indication of this is the fact that the notional value contracted by banks in October 2001 was 3.2 times the notional value registered in December 2000.

Credit rating systems

An important requirement for the development of corporate debt is a credit rating system. In Chile, rating agencies were created as a consequence of the pension reform. All securities offered publicly require at least two independent credit ratings. At the beginning, ratings by private agencies were revised by the Risk Rating Commission, in order to secure an adequate procedure in the market. Nowadays private ratings are not revised, although the Commission can order a third rating if the two original ratings differ considerably.

Disclosure systems and information

The Superintendency of Securities and Insurance (SSI) requires all issuers of publicly offered securities to disclose a standardised set of information. Normally the information has to be provided to the SSI and all stock markets and intermediaries. This set of information includes:

- economic and financial data: quarterly and annual reports and financial statements; reports on capital variations;
- disclosure of essential or relevant facts;
- other information, such as reports from stockholders' meetings and changes in administration.

Specific regulation: shelf registration

Shelf registration is allowed in the Chilean market. This gives issuers a larger degree of freedom to select the timing of their placement.

Infrastructure

Among the areas that require improvement in the Chilean market are trading platforms, which need to be upgraded. Private issuers complain that the current structure is not suitable for large placements.

5. Concluding remarks

Between 1975 and 1981 the Chilean financial system experienced a significant expansion, as a result of a liberalisation process that put an end to 30 years of financial repression. This process ended in a severe financial crisis in 1983, as the liberalisation of interest rate and credit controls was not accompanied by the additional supervisory capabilities required by a deregulated capital market. As a result, in the mid-1980s the country opted for a system of prudential regulation, which improved banking supervision and modernised the non-banking areas of the financial system. The main reform was the development of a new pension system, where the existing state-operated pay-as-you-go system was replaced by a fully funded system with private provision.

Since the mid-1980s the Chilean capital market has grown remarkably in size, depth and liquidity. The private pension system is at the root of this important transformation, which has greatly influenced the rest of the financial system. The Chilean banking system became one of the healthiest and most competitive in Latin America, while other institutions, such as the domestic stock market, financial intermediaries and institutional investors all expanded markedly.

However, this extraordinary performance came to a halt in 1995. In 1996 stock market transactions fell significantly and did not recover their pre-1995 levels. Controls on capital flows, overregulation, concentration of the pension industry, and other industry-specific factors have reduced the liquidity of the stock market. The elimination of restrictions on capital flows in April 2001, together with reform of capital markets legislation, will surely have an important impact on stock market valuation and liquidity.

Fixed income transactions, on the other hand, increased as a percentage of GDP between 1995 and 1998, but fell significantly in 2000. The evolution of liquidity in the fixed income market differs from that in the stock market, however, and is explained primarily by two domestic developments. These are the increase in concentration of the pension fund industry, and the financial contagion created by the Russian crisis in 1998, which led the central bank to increase policy interest rates sharply to defend the currency, and resulted in major capital losses for the holders of fixed income instruments. This event gave rise to a sharp reduction in transactions.

Since the end of 2000, the government has enacted two laws to stimulate the development of domestic capital markets: the IPO Law and the Reform of Capital Markets Law. These reforms are expected to improve market liquidity and the access to funds by small and medium-sized companies, increase competition in the local market for outstanding instruments, and set up a better framework for developing new instruments in the future.

The paper pays particular attention to the evolution of the market for corporate debt in Chile, with special emphasis on the ways in which public policy in general, and the management of public debt in particular, helped to foster its development.

In this respect, the paper stresses two points. First, public debt has been issued regularly at specific maturities for almost 10 years. This regularity has implied that a yield curve exists which can be used

to price bonds issued by the private sector. A particular characteristic of this curve is that it has long maturities denominated in local currency, which is unusual for emerging markets. The Central Bank of Chile has been issuing 20-year bonds since 1993.

A critical feature for the development of a long-term debt market in Chile has been the UF (unidad de fomento), an indexing unit that protects contracts from inflation. The existence of this unit has allowed the Chilean economy to have long-term assets denominated in local currency.

The second critical point is the reform of social security that took place in Chile in 1980, which established a stable demand for fixed income instruments through pension fund investments, and also a demand base for the development of a life insurance industry. Both pension funds and the life insurance companies form a significant demand base for public as well as private bonds. They each specialise in a different segment of the market, with the life insurance companies demanding the longer maturities.

The pension reform implied a major change for the Chilean financial market. It generated a large demand for regulatory and institutional innovations. These innovations implied a positive externality for other agents in the financial market, since they benefited from an environment that made financial markets more modern and transparent.

In contrast to the stock market, private debt markets have shown a continuous recovery in recent years. A significant reduction in domestic interest rates and the depreciation of the Chilean peso have motivated firms to look for funding in the local market. Private issuers have been active in tailoring products to make them more attractive to investors in terms of maturities, denominations and payment schedule.

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The costs and benefits of developing debt markets: Hong Kong's experience[1]

Guorong Jiang, Nancy Tang and Eve Law

1. Introduction

In the aftermath of the Asian financial crisis, the role of the debt market has received increased attention. A common view, shared and advocated by Asian policymakers, has been the need to promote the development of local as well as regional debt markets as part of the response to the crisis. This view is based on the belief that the crisis was caused in part by the over-reliance of Asian corporations on the banking system for short-term, often foreign currency denominated, funding.[2] Such capital flows were highly volatile, and led to currency and financial sector crises when large inflows suddenly reversed. Since Asian economies had the highest savings rates in the world, corporations would not have needed to resort to banks for such foreign capital flows for financing if local debt markets had existed to channel more savings into domestic investment. This paper sheds some light on the rationale for developing the Hong Kong debt market from the perspectives of macroeconomic stability and microeconomic efficiency. Section 2 gives an overview of the financing channels in Hong Kong. Section 3 discusses how well the debt market could function as an alternative source of financing. Section 4 examines how development of the debt market could improve the efficiency of financial intermediation. Section 5 concludes by looking at policy implications.

2. Financing channels in Hong Kong

Bank lending and equity and bond issuance are the main vehicles for corporate fund-raising and channelling savings. Several features of these financing channels in Hong Kong are notable.

Bank lending and equity financing in Hong Kong dominate corporate financing. Savings - which are high by international standards - are mostly channelled through the banking system and the equity market. This is similar to other Asian economies, but significantly different from the United States and several Latin American countries, where direct financing from the capital markets (stock and bond markets) dominates indirect financing intermediated by commercial banks

The banking system in Hong Kong is well supervised, and proved to be resilient to external shocks during the Asian financial crisis (Graph 1). Although the non-performing loan ratio jumped after the crisis from 1% of total loans during 1995-97 to over 5% in 1999, provisions increased and returns on assets declined, banks remained well capitalised at about 18% throughout the period. By 2000, indicators of banking sector performance started to improve again.

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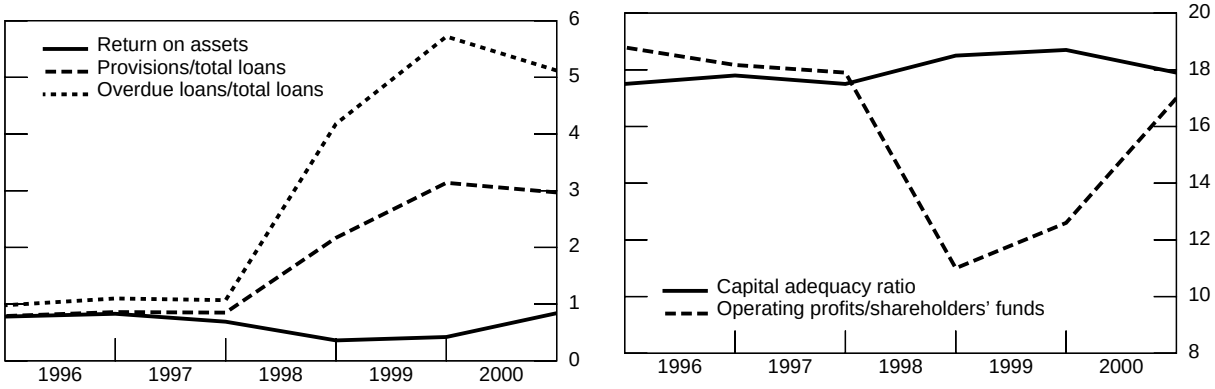
[1] This is an edited version of the paper "Cost-benefit analysis of developing bond markets", published in the November 2001 issue of the *Hong Kong Monetary Authority Quarterly Bulletin*.

[2] One explanation for the overreliance of Asian economies on short-term, foreign currency denominated funding, offered by Eichengreen and Hausmann (1999), is that the incompleteness of financial markets, which they term "original sin", resulted in the inability to borrow abroad in domestic currency or to borrow long-term domestically. This led to financial fragility because of the currency and maturity mismatches for domestic investment and was exacerbated by a weak banking system, which has shown its inability to intermediate savings to investment efficiently in many of the Asian economies. As a result, dollarisation and the development of a domestic debt market have been proposed as solutions to the currency and maturity mismatches.

Graph 1

Performance of Hong Kong's banking sector

In percentages



Notes: Figures are for all authorised institutions in Hong Kong except operating profit/shareholders' funds and the capital adequacy ratio, which refer to local banks only. Up to 1998, overdue loans include loans overdue for more than three months and bills and rescheduled loans. Thereafter, overdue loans include loans overdue for more than three months and rescheduled loans, excluding loans also reported under loans overdue for more than three months.

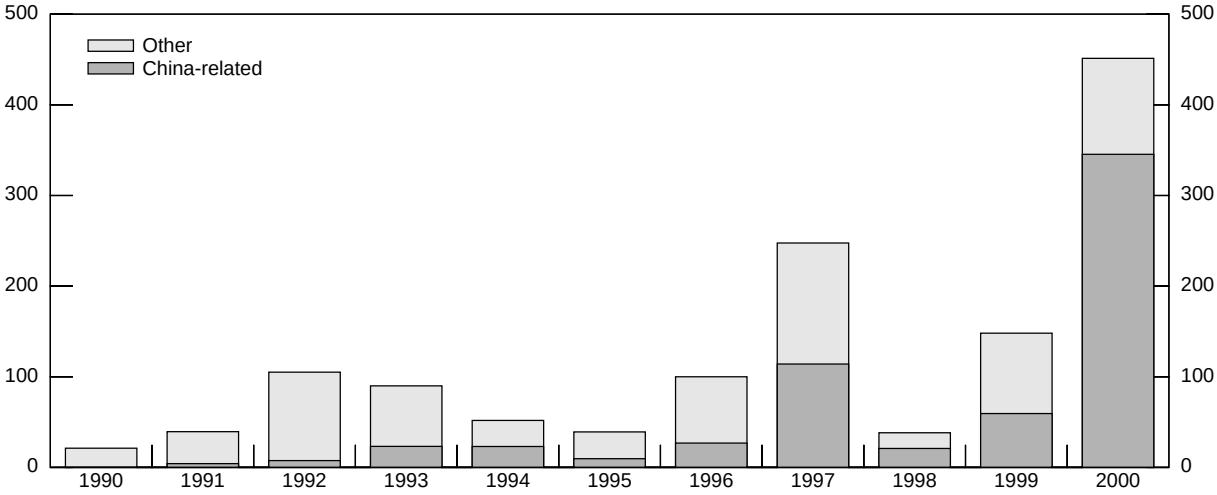
Source: HKMA.

The stock market has been functioning well in Hong Kong, channelling substantial amounts of finance to the corporate sector. Although equity prices have been quite volatile, they have outperformed US equities over the past decade. Market capitalisation has more than doubled since 1990, reaching 377% of GDP in 2000. Total equity funds raised on the main board increased from HK$ 20 billion in 1990 to HK$ 450 billion in 2000, while China-related entities raised a record HK$ 345 billion from the Hong Kong stock market in 2000. Even excluding the funds raised by China-related entities, the amount of funds raised for Hong Kong corporations increased fourfold over the past decade (Graph 2). Despite the rapid growth in market capitalisation and impressive long-term returns to investors, price-earnings ratios have been modest, generally fluctuating in the range of 10-20. The average P/E ratio of 15.7 was lower than the post-World War II average value of 17 for US stocks. The earnings growth of listed companies averaged 18% per year over the past decade (Graph 3).

Graph 2

Total equity funds raised in the main board, 1990–2000

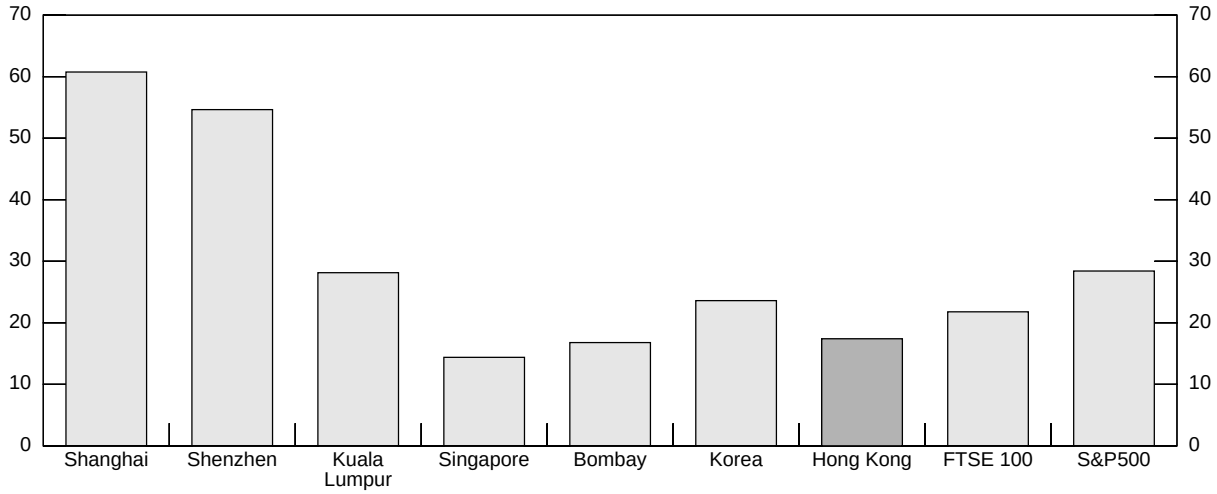
In billions of Hong Kong dollars



Source: Hong Kong Exchanges and Clearing Limited.

Graph 3

P/E ratios of selected stock markets



Note: P/E ratios are at end-May 2001, except for Shanghai and the S&P 500, which are at 30 April and 20 June respectively.

Sources: CEIC; Bloomberg.

Overall, the banking sector in Hong Kong has been functioning well in providing financial intermediation, and the stock market has provided an effective alternative source of funding to bank lending for long-term, non-debt-creating financing in the local currency. The stock market also improves corporate governance by protecting minority shareholders' rights in listed companies and ensuring that transparent accounting and auditing standards are followed (see Cheung (2000)). The rest of the paper studies what major potential gains and costs may arise from the development of the local debt market in Hong Kong, drawing from international experience.

3. Debt market as an alternative source of financing

Finance plays an increasingly important role in economic growth. In channelling savings to investment, the financial system contributes to economic performance through several channels - mobilising savings, allocating funds to their most productive uses, monitoring managers and transferring and sharing risks (see World Bank (2001)). In modern economies, disruptions in the flow of credit are detrimental to economic activity and lead to unemployment, cancelled investment plans and even recession. Capital account liberalisation and increasing globalisation add an international dimension for capital flows.

The development of debt markets might mitigate the adverse impact of financial crises or reduce the likelihood that a crisis will happen. The reasoning is that bond markets could provide an alternative source of financing if other financing channels, such as bank financing, dry up. Greenspan (2000) stressed the importance of having multiple avenues of financial intermediation, which served the United States well during the credit crunch of the late 1980s when bond markets substituted for the loss of bank financial intermediation in a banking system crisis related to the real estate cycle. This view has gained popularity in recent years, especially in the aftermath of the Asian financial crisis. However, whether the bond market constitutes such an effective alternative source of financing depends crucially on there not being a high co-movement between bank lending, bond and equity financing in a domestic setting, and the absence of contagion in the international capital markets, especially for countries with open capital accounts.

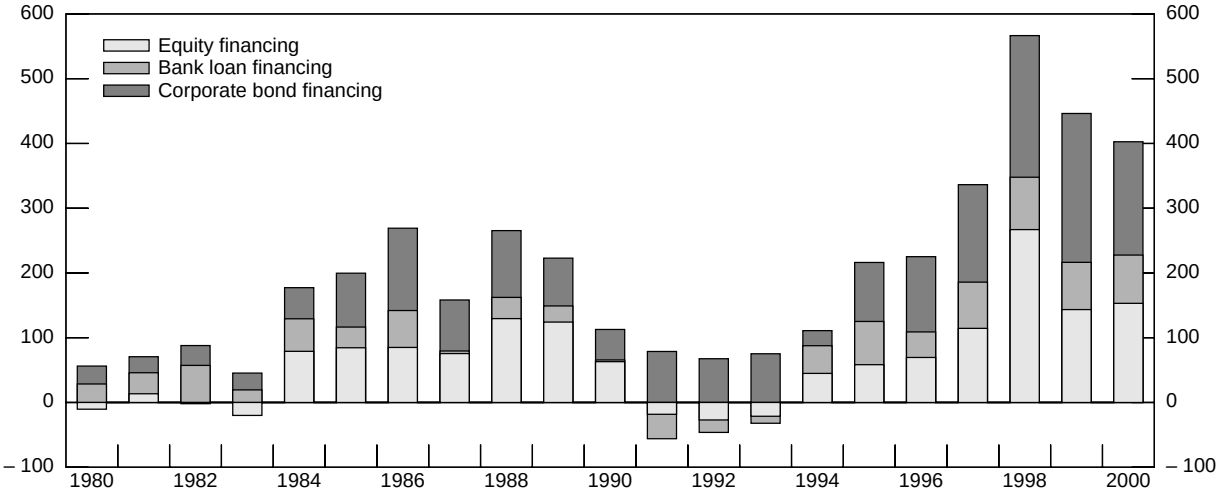
In the international setting, a large body of literature has examined the effect of contagion and the channels for transmission in emerging markets, both theoretically and empirically, since the 1997 Asian financial crisis (eg Pritsker (2000) and Hernandez and Valdes (2001)).[3] Contagion has been defined broadly as the transmission of shocks in one economy (or one sector) to another not explained by changes in economic fundamentals. Though it is difficult to control for fundamentals in empirical studies, contagion could occur through a number of channels, including the real sector, financial markets and financial institutions, and through the interaction of financial institutions and financial markets. Empirical studies have found increasing evidence indicating the importance of financial factors in spreading the shocks, in addition to real sector linkages such as similar macroeconomic fundamentals and trade flows. One implication of the important role financial contagion plays in crises is that financial markets, including the debt market, could provide a mechanism through which financial crises spread. This challenges the view that debt markets are likely to mitigate the negative effects of crises by providing an alternative source of financing at times of stress.

In this section, we look at a number of country experiences during financial crises, which suggest that debt markets could provide either an alternative source of financing (Box 1 and Graph 4) or a channel through which contagion spreads (Box 2). A simple panel regression is estimated to study the potential for the domestic debt market to function as an alternative source of financing.

The experience of US bond markets during two banking crises - one resulting from the Latin American debt crisis in the 1980s and the other from the real estate crisis of 1990 - showed how bond markets can provide an alternative source of financing in a domestic setting (Box 1 and Graph 4). During these periods, the US banking sector suffered large losses that reduced its capital base drastically and severely curtailed its ability to lend. The ensuing liquidity crunch substantially reduced bank credit to US corporations. The US domestic bond markets, to varying degrees, functioned as alternative sources of financing for corporations when the banking sector was under stress.

Graph 4
Funds raised by US corporates

In billions of US dollars



Notes: US non-farm and non-financial corporations. Net funds raised by US corporates are measured in terms of flow-of-funds statistics calculated as the difference in outstanding amounts of different time periods.

Source: Federal Reserve Bulletin (Flow of Funds).

[3] The earlier literature focuses on the characteristics of the linkages of financial markets, especially after the October 1987 stock market crash in the United States. These studies find that there is an increase in the interdependence of national equity markets, and high levels of correlation between national equity markets during times of market stress. The spillover effects are found to be asymmetric - negative shocks in one market had a larger effect on volatility in another market than positive shocks. Recent studies, such as Clare and Lekkos (2000), of the correlation between national bond markets in Germany, the United Kingdom and the United States found similar results - the linkages between these markets become stronger at times of market stress.

Box 1

The US bond market during two banking crises

Latin American debt crisis in the 1980s

The debt crisis in less developed countries (LDCs) broke out in August 1982, when Mexico was unable to service its outstanding debt to US commercial banks. The situation continued to worsen and, by 1983, 27 countries owing US$ 239 billion could not meet their debt obligations. Sixteen of them were in Latin America and the four largest - Mexico, Brazil, Venezuela, and Argentina - owed about 75% (about $176 billion) of the total LDC debt outstanding. This crisis was largely attributable to the overexposure of major US commercial banks to LDCs, which were eager to expand their overseas markets amid strong local competition. LDCs, especially rapidly growing Latin American countries with low domestic savings rates, needed external funding to finance investment activities.

The oil price increases in 1979, rising interest rates in the United States and a strengthening dollar in the early 1980s severely affected the LDCs' capacity to service their debt, triggering the crisis. The US banking system was at risk, as by end-1982 major US commercial banks' exposure to the LDCs represented about 250% of their capital. Massive loan losses on LDC debt led to a sharp reduction in bank lending - bank loans to US non-farm and non-financial corporations tumbled to $19 billion in 1983, down 66% from 1982 (Graph 4).

Commercial real estate crisis of the late 1980s - early 1990s

The banking crisis in the late 1980s and early 1990s was a result of aggressive lending to the commercial real estate industry. Against the backdrop of the unanticipated and sharp rise in inflation in the late 1970s, there was a strong speculative demand for commercial real estate, especially in the office sector. Many commercial banks were active in real estate lending, partly owing to the large up-front fees. From 1980 to 1990, commercial real estate loans increased from $64 billion to $238 billion.

Starting in the late 1980s and continuing into the early 1990s, the credit quality of real estate loans deteriorated rapidly, as the 1990-91 recession reduced the demand for commercial space, resulting in sharp falls in rents and prices. The downturn in the real estate sector was compounded by loose underwriting standards of commercial banks focusing on collateral values, and the closing of insolvent savings and loan institutions. As a result, many banks failed or suffered heavy losses. The ensuing contraction of loan financing for corporations became inevitable. Borrowing from banks by US corporations dropped from $32 billion in 1988 to a net repayment of $38 billion in 1991.

Multiple avenues of financial intermediation

One feature of the US financial system is the availability of multiple avenues of financial intermediation. During the above two banking crises, the existence of different sources of financial intermediation served the United States well. The liquidity crunch in the wake of banking crises, caused by either external (the LDC debt crisis) or domestic (commercial real estate crisis) shocks, threatened to disrupt normal credit flows in the economy, which could have had severe adverse effects on the real economy. In the event, cutbacks in bank loans after 1982 and the early 1990s were substituted by increases in bond financing (Graph 4). The fact that no particular increases in the yields of investment grade corporate bonds were observed when the bond market took over from the banking sector as a source for corporate financing demonstrates the smooth functioning of the bond market. Had a functional debt market not existed, corporations could have been more vulnerable to the banking crises.

In contrast, the experience of several emerging economies that went through financial crises did not show strong evidence that debt markets functioned as an alternative source of financing (Box 2). The bond markets in Argentina, Brazil, Russia and Turkey did not help to reduce the volatility during crises - on the contrary, the bond markets usually were the first markets to collapse under pressure and seemed to be a channel for spreading financial contagion. One possible explanation is that banks have more information about individual borrowers than bondholders do. As a result, bondholders tend to act quickly on the same information - they are more likely to exhibit herding behaviour than the banks. Such herding behaviour could be rational given imperfect information (see Bikhchandani and Sharma (2000)).

Empirical analysis

Most of the available empirical studies have focused on financial contagion across countries and have provided evidence on the role played by debt markets as alternative sources of financing in an international setting. However, the degree of co-movement of domestic bank financing and bond and equity issuance remains an important question, particularly in judging the effectiveness of the local debt market as an alternative source of financing in a domestic setting.

Jiang et al (2001) present the detailed result of a regression study using the database on financial development and structure, constructed by Beck et al (1999) at the World Bank. In the first model, the dependent variable is the growth rate of the ratio of long-term private debt issues to GDP. The independent variables include bank lending (measured by the growth rate of the ratio of domestic credit to the private sector to GDP), the growth rate of the ratio of equity issues to GDP, a lagged dependent variable, and the growth rate of real GDP. The last variable is included to account for the fact that if the economy is in a recession, total demand for financing is likely to be reduced irrespective of funding availability. In the second model, the dependent variable is the growth rate of bank lending. The independent variables include growth rates of bond and equity issuance, bank profitability, the output gap, the risk spread over US Treasuries and a lagged dependent variable. This model examines the relationship between bank lending and bond issuance, after controlling for some of the common factors affecting bank lending. A group of 32 economies[4] is covered for the period of 1981-95 for the first model. Only 13 OECD countries are covered for the second model, owing to limited data availability.

The panel regression results indicate evidence for the co-movements of bank lending and bond issuance. In particular, under most model specifications, increases in bond issuance are associated with increases in bank lending, while the coefficients on equity issuance are also positive but not significant. Under the first model, the relationship is even stronger for OECD countries than for non-OECD countries, though the quality and availability of data on the latter country group may have contributed to this result. Higher real GDP growth has the expected positive effect on bond issuance. Under the second model, we also find that bond issuance is positively related to bank lending, after the effects of bank profitability, output gap and risk spreads are taken into account.

[4] Argentina, Austria, Brazil, Canada, Chile, China, Colombia, France, Germany, Greece, Hong Kong, India, Indonesia, Italy, Japan, Jordan, Korea, Luxembourg, Malaysia, Mexico, the Netherlands, Peru, Philippines, Portugal, Spain, Switzerland, Thailand, Tunisia, Turkey, the United Kingdom, the United States and Venezuela.

Box 2

Bond markets in emerging economies during recent financial crises

The underlying causes of the recent financial crises were the deterioration in the external environment (eg the US economic slowdown, a tightening of liquidity conditions in industrial countries, or adverse commodity price movements) and individual country weakness in policies (such as incompatible fiscal, monetary and exchange rate policies and fragile financial sectors). However, developments in the international and domestic bond markets played an important role.

Russia - August 1998

In August 1998 the Russian government devalued the rouble and unilaterally restructured its domestic debt. The crisis had its root in the large and chronic fiscal deficit. This led to a rapid build-up of government debt, held by domestic as well as foreign investors. By late 1997, rouble-denominated instruments were the main ones issued by the Ministry of Finance to finance the deficit, with non-resident investors holding about one third of the outstanding domestic securities. Domestic political events and weak oil prices in the first half of 1998 made the issuance of rouble-denominated debt difficult and the government increased US dollar-denominated eurobond issuance, sending the stock of eurobonds from $4.6 billion to $15.9 billion during March-July 1998. As bond redemptions and coupon payments reached over $1 billion a week in the second half of 1998, the eurobond yield spread rose to 1800 bp in August, and oil prices reached 10-year lows, the government was unable to roll over its debt in the domestic as well as foreign bond markets. Massive sell-offs followed in the debt, equity and foreign exchange markets. Liquidity in the interbank market dried up as fears of bank failures led to runs on bank deposits. The crisis led to a widespread flight to quality and liquidity, and quickly spread to both emerging and mature markets.

Brazil - January 1999

The root of Brazil's crisis was the failure of the government to control the fiscal deficit, with the public sector borrowing requirement approaching 8% of GDP in 1998. Large financing needs made Brazil vulnerable to investor sentiment and capital outflows. In the wake of the Russian crisis, non-resident and domestic holdings of Brazilian debt and equity instruments were significantly reduced. The need to roll over large amounts of domestic debt in September-November 1998 added to the pressure in the domestic debt market. The sell-off in domestic debt and foreign exchange markets led to massive capital outflows, with international reserves falling to $42 billion at end-October 1998 from $71 billion in July. The treasury and the central bank had to cancel domestic debt auctions in September 1998 and reduced the amount for tender in subsequent auctions as the spreads soared. In January 1999 the Brazilian real was floated.

Argentine and Turkish bond market sell-off - November-December 2000

In late 2000, Argentina suffered a massive sell-off of its bonds in the international market, with spreads on sovereign debt increasing from around 650 bps in early October to about 1000 bps in early November. The deterioration of the external environment, mainly the rapidly widening US high-yield spreads, led to sharp across-the-board widening of emerging market spreads. Chronic fiscal weakness, which made Argentina the largest emerging market borrower in the international debt markets, and heightened political tensions attracted investors' attention.

Turkey suffered a full-blown liquidity crisis in late November-early December 2000, following the sell-off in Argentina. The crisis reflected deteriorating external liquidity conditions and weak domestic banking and exchange rate systems. The crisis was triggered by the withdrawal of external credit lines and syndicated loans to Turkish banks. The ensuing credit crunch in the banking system forced banks investing heavily in the government securities market to sell their T-bill holdings. This pushed the yields above stop-loss levels of foreign investors and other local banks, triggering a massive sell-off in the domestic bond markets. In turn, this forced the primary dealers to suspend trading in government paper. Foreign investors, who had substantial positions in local markets, rushed for the exit, as concerns about the foreign exchange exposures of the domestic banking system and the quality of their forward cover mounted. During the crisis, Turkey lost about $7 billion in foreign exchange reserves. Overnight interest rates rose sharply (to over 2,000% at one time). The external debt spread widened by 174 bps. Trading in T-bills was suspended with yields jumping from around 35% to 90%, and the equity market lost over 35%.

The positive correlation between bond issuance and bank lending, even after controlling for demand and supply factors, implies that bond markets may not function as an effective alternative source of financing. The development of the bond market may not help to prevent, or to mitigate the effect of,

financial crises. Loss of confidence among a large investor base - resulting from a deteriorating macroeconomic situation or a banking sector problem, or even self-fulfilling prophecies - could turn into a credit squeeze in the bond market, which could in turn spread to other financing channels, aggravating the situation. In fact, as observed in a number of recent financial crises, no matter where the initial tension (overextensions in bank lending, government/corporate overborrowing in bond markets, overvalued exchange rates or equity market bubbles), it could quickly spill over to other credit channels (Box 2)

Whether the debt market can function as an alternative source of financing during times of stress is debatable - it seems to depend on the underlying causes of the crises. The US experience indicated that bond markets could function well, as long as the cause of the banking system crisis is limited in scope. In other emerging market cases, rapid contagion effects across financing channels and countries appear to render the bond market a source of instability.

Emerging debt markets have shown high correlations of bond returns in individual countries and periodic closures of all emerging debt markets to new issues. This is indicative of the high degree of market co-movement. Table 1 shows the unweighted average cross-correlation of daily bond returns among nine major emerging market countries - Argentina, Brazil, Ecuador, Mexico, Panama, Peru, Poland, Russia and Venezuela - from 1994. It also shows the closures of the emerging debt markets from 1993, defined as the periods when the issuance level was less than 20% of the period's trend issuance level.

- Over 1994-2000, the average cross-correlation was 0.51, indicating substantial co-movement of individual country returns.
- The average cross-correlation rose sharply during the crises and fell afterwards. The increases were particularly large during the Asian and Russian crises, reaching 0.8-0.9.
- The average cross-correlation has declined substantially since the Russian crisis in August 1998. Recent peaks observed during the Brazilian and Argentine/Turkish crises were in the range of 0.5-0.6, from around 0.2-0.4 during normal times.
- The inability of the emerging markets to issue new debt was characterised by the rapid widening in spreads, rather than their absolute level. Such closures were closely related to the sharp increases in the average cross-correlation of individual country returns.

Table 1

Co-movement of emerging debt markets during financial crises

Period	Average cross correlations	Durations of market closures
Mexican crisis - January 1995	0.80	5 weeks
Thai baht attacked - early May 1997	0.72	
Asian financial crisis - October 1977	0.92	8 weeks
Russian default - August 1998	0.82	13 weeks
Floating of Brazilian real - January 1999	0.60	
Argentine and Turkish sell-offs - Nov/Dec 1999	0.53	5 weeks
Average 1994-2000	0.51	

Source: IMF (2001).

The experience of Hong Kong seems to be closer to that of the United States. Financing activities of local corporations in Hong Kong during the past few years demonstrate that the local debt market did substitute for bank financing to some extent in the aftermath of the Asian financial crisis. However, its effect has been limited owing to its small size (Table 2). The collapse of property prices and the recession led to deteriorating asset quality and the adoption of a conservative lending stance by the banking sector. Compounded by the withdrawal of Japanese banks owing to domestic financial sector

problems, total bank lending dropped substantially in 1998-99. Meanwhile, corporate bond issuance, traditionally outweighed by bank and equity financing, increased significantly and partially filled the gap. This contrasts with the experience during the early 1980s when the property market collapsed and a few banks failed. The sharp contraction in bank lending resulted in major financing difficulties for local corporations, as the debt market was virtually non-existent at the time.

Table 2
Financing activities of local corporations
(in billions of Hong Kong dollars)

Year	New Hong Kong dollar debt issuance by local corporates	Funds raised in Hong Kong equity market*	Increase in domestic loans	Total
1996	4	100	250	354
1997	13	248	408	668
1998	6	38	– 121	– 76
1999	24	150	– 176	– 2
2000	16	463	33	512

* Includes H-shares and Red Chips, and covers IPOs, rights issues, private placements and funds raised from the GEM.

Source: HKMA.

4. Debt market and efficiency gains

In the microeconomic context, arguments based on the theory of information asymmetries suggest that bond markets may improve efficiency in an economy and reduce vulnerability to financial crises (see Herring and Chatusripitak (2000)).[5]

Bank loans and corporate bonds deal differently with information asymmetries. Banks take the credit risks away from the depositors and manage their risks by monitoring borrowers. Bond financing involves public investors taking on credit risks themselves. As a result, bond financing spreads the risks over a large group of diverse bondholders, much wider than bank financing could achieve. In addition, bond financing does not involve maturity transformation, as investors are fully aware of the yields and time horizons of their investment. Bank financing, on the other hand, inevitably involves maturity transformation, as liabilities of banks are typically short-term in nature, while assets have longer maturities. The existence of a domestic bond market may also reduce the need to borrow abroad and so reduce potential currency mismatch. An economy with a well developed corporate bond market has stronger market discipline than one dominated by bank lending, as investors would require disclosure of information and transparency in corporate operations to protect their interest and reward strong performers with lower funding costs (see Hakansson (1999)).

A well developed debt market can also increase economic welfare as it complements other financial instruments to provide a full spectrum of investment vehicles whose payoffs across contingencies or states of nature cannot be easily replicated by other securities in the market. For example, certain classes of investors (such as pension funds and insurance companies) prefer to hold low risk debt instruments, with a stable income stream, which could not be provided by the equity market.

A well developed bond market also provides important benefits to the economy:

[5] In perfect capital markets, Modigliani and Miller (1958) showed that no matter how the capital structure of a firm was divided among debt, equity or other claims, the investment value would be the same, since the total investment value of a corporation depends only on its underlying profitability and risk.

- It provides a yield curve, a market-determined term structure of interest rates. The key use of the yield curve is to serve as a benchmark for pricing credit risk, bank loans and equities. For macroeconomic policymakers, the shape of the yield curve provides useful information about market expectations of future interest rates and inflation rates. The bond market is the base for developing efficient derivatives markets (forwards, futures, swaps and options) for managing financial risks at low cost.
- It could lower funding costs for best quality borrowers, as intermediation costs are lower for bond than for bank financing. Borrowers on the borderline between investment and non-investment grade creditworthiness require more customised analysis, underwriting and structuring by banks, which are better equipped to assess such borrowers.
- It introduces competition with the banking sector, perhaps reducing the dominance of banks in providing corporate financing. If banks themselves issue bonds, they will be subject to increased market discipline, with their performance being reflected in bond prices. This discipline may serve as a useful adjunct to official banking supervision.
- It allows the transfer of risks through securitisation. The bond market provides an important venue for banks to repackage loans and sell them as bonds (such as mortgage-backed or other asset-backed securities). This reduces banks' exposure to liquidity risk and mitigates their maturity mismatch.

Though bond financing could mitigate the maturity mismatch, empirical studies have yielded mixed results on the effect of the bond market on the maturity structure of corporate debt. A cross-country study by Schmukler and Vesperoni (2000) covering Argentina, Brazil, Indonesia, Korea, Malaysia, Mexico and Thailand examines the financing choices of the corporate sector based on firm-level balance sheet data. It finds that firms with access to international bond markets increased long-term debt and extended their debt maturity structure (with a lower proportion of short-term debt over total debt), relative to firms with no access to international bond markets. This is consistent with bonds generally having a longer maturity than bank loans. However, the same study finds no significant differences in the maturity structure of debt in bank-based and market-based economies. The experience in Chile indicates that the development of the domestic bond market did not lengthen the maturity structure of firms' debt.

5. Conclusions

There are substantial macroeconomic and microeconomic benefits in a well developed bond market. Microeconomic efficiency gains, through diversification and control of credit and liquidity risks, improved corporate governance and better pricing of risks, are likely to have the macroeconomic effect of reducing the probability of financial crises and limiting any negative effects from them.

However, it should be noted that there are also risks arising from the development of debt markets, which may act as a potential channel for spreading financial contagion. In addition, the debate on the relative merits of a bank-based versus a market-based financial system is far from conclusive, despite the potential efficiency gains discussed above. Levine (2000) examines the relationship between financial structure and economic growth based on a broad, cross-country database. He finds no cross-country empirical evidence favouring either market-based or bank-based financial systems. Neither system is particularly effective at promoting growth; "countries with well developed banks but poorly developed markets do not perform notably differently from those with very well developed markets but poorly developed banks, or than those with more balanced financial systems after controlling for overall financial development". However, the study does find that the legal system is a crucial factor in financial development and that better developed financial systems enhance growth.

As a result, policy efforts should not be directed at favouring a particular financial structure, such as bond markets over the banking sector. Instead, efforts should be directed at improving the functioning of the financial sector, whether it is bank-based or market-based. This highlights the importance of efforts to build an efficient market infrastructure and to reduce information asymmetries. Such efforts also help realise the full potential of efficiency gains from the debt market and limit the downside risks of herding behaviour often observed in emerging bond markets. In particular, improvements in market transparency such as accounting and disclosure standards, and the establishment of a legal and regulatory framework consistent with international best practice and with strong enforcement, will help

investors to differentiate better among emerging markets at times of pressure and reduce contagion effects. The recent decline in the cross-correlation of the emerging debt markets could be partly attributed to international efforts in this area.

The HKMA, together with other government regulatory and supervisory agencies, has focused its efforts over the past decade in developing a supportive environment in which a well functioning debt market in Hong Kong can grow. The Exchange Fund Bills and Notes programmes introduced in 1990 established a benchmark yield curve extending to 10 years. A market-making system has been set up, and efficient clearing and settlement systems, for both Hong Kong dollar and US dollar payments and instruments, are in operation. In addition to the establishment of an efficient market infrastructure, the accounting and disclosure standards are high by international standards, and have constantly been improved to match international best practice, and a transparent legal and regulatory framework ensures that market discipline functions effectively.

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Developments in the Hungarian debt markets

György Sándor

1. Introduction

The motives behind the development of the debt markets in Hungary are diverse and have changed over time. Initially the stimulus came from concerns about rollover risk and exchange rate risk for the Treasury. In the second half of the 1990s monetary policy considerations about the information content of the yield curve and concerns about the transmission mechanism added impetus to the development of the debt markets. More recently financial sector stability and convergence-related issues have become important and these might finally facilitate the evolution of a well functioning corporate bond market. An additional boost for debt markets may come from the development of derivatives markets, especially interest rate derivatives, after the lifting of all remaining restrictions on capital account transactions. However, some legal hurdles, eg in the case of repos, remain.

2. The government securities market

The Hungarian government securities market is now a developed and mature market, one of the most liquid and sophisticated in the region. The two most important driving forces were the need to reduce rollover risk and the need to mitigate exchange rate risk for the Treasury. The former required the lengthening of the maturity spectrum of government bonds while the latter called for the issuance of local currency denominated bonds. Monetary policy considerations pushed for fixed income issues. Due to these very strong motives the Hungarian government securities market developed impressively in the 1990s.

In 1988 the central bank began to auction three-month Treasury bills. Currently, Hungarian government bonds are issued for five benchmark maturities, namely two years, three years, five years, 10 years and 15 years, by the Government Debt Management Agency. The first auction of the two-year and three-year fixed rate bonds was in 1996. The new 15-year fixed rate bond was issued in November 2001. The average maturity of auctioned securities was between three and six months in 1994 while it is 2.3 years currently (four months for T-bills and almost three years for marketable government bonds). All marketable bonds issued since 1 April 1999 have been dematerialised.

In the early 1990s private placements of government bonds were common, with no data disseminated on the winning price or any other detail of the terms and conditions. Auctions have become a regular and frequent technique since March 1996. The transparency of the primary market has been improved by regular dissemination of an issuing calendar.

Currently the issuance of government securities is organised through a primary dealer system. The system was established in January 1996 to provide a more secure basis for financing the budget deficit, to reduce financing costs through market mechanisms and to facilitate the expansion and transparency of the secondary market. The basic responsibility of primary dealers is to trade large volumes of government securities with large investors. One of the basic responsibilities and exclusive rights of primary dealers is to bid regularly at auctions. However, their most important obligation is to quote two-way (bid and offer) prices to ensure the liquidity and transparency of the secondary market.

The typical auction size is HUF 15-25 billion (around €50-90 million). The total issue size is typically HUF 100-150 billion (€350-550 million). Turnover has increased since the full liberalisation of the capital account in May 2001. On a typical trading day turnover of government securities is roughly HUF 80-85 billion (about €300 million), which is around 2% of the total outstanding stock of marketable government securities (total HUF 4,200 billion; €17 billion). In 2000 turnover was almost six times the average outstanding stock.

The debt management strategy implies no foreign exchange denominated issuance for 2002. The fiscal deficit and the rollover of former debt will be financed solely from the domestic market.

3. The corporate bond market

While the government securities market is well developed and deep, other debt markets are painfully missing. There are several reasons for this.

- The *macroeconomic situation* was not favourable for the development of fixed income markets. Due to the high and variable inflation, nominal rates varied between 30 and 40% and real rates exceeded 10% in 1995. Subsequently they have fallen back to 10% and 4% respectively.
- As the *exchange rate regime* gained credibility between 1995 and 2001, companies tended to favour foreign currency debt as domestic interest rates were higher than the sum of the preannounced depreciation path and foreign interest rates. Foreign exchange risk was perceived as small, or at least smaller than implied by Hungarian yield premia.
- The *Hungarian privatisation strategy* preferred the sale of state assets to dedicated professional investors and international financial investors on a cash basis and in many cases with a promise of further investments. This led to a situation where the biggest companies financed their investments from retained earnings and/or (foreign currency denominated) loans from their parent companies.
- *Structural problems* also played a role. The lack of sufficient rating agencies and appropriate hedging instruments made corporate bonds very risky. The lack of liquidity led to significant issuance costs and pricing problems. The privatised banks were very agile and innovative in competing for corporate clients, which pushed down the cost of bank funds.

There is anecdotal evidence that with the decreasing interest rates, some financial institutions are considering issuing bonds. It is worth mentioning, however, that it is not obvious that there is a need for a domestic currency denominated corporate bond market as the country marches into EMU. There are fears that the big corporations are going to issue bonds in the euro market.

4. Prospects and policies

One potential driving force for the development of debt markets is the expected growth of derivatives markets. Despite full liberalisation, these markets are still not very liquid though there are signs that interest rate swaps are gaining popularity. The most important segment currently is the foreign exchange swap market. Interest rate derivative products and options only play a marginal role at this point.

Government securities markets may be boosted further if some legal hurdles (such as collateral not being exempt from bankruptcy procedure) are abolished.

Central banks may facilitate the development of debt and derivatives markets by adopting the best international practices for accounting, clearing and settlement, collateral etc. when using these instruments. For example, currently the collateral practices applied in the market are different from those applied by the central bank.

Issues and challenges in the development of the debt market in India

Y V Reddy[1]

1. Introduction

This paper discusses the issues and dilemmas faced in the development of the debt market in India. After narrating the country context, the profile of the debt market in terms of outstanding issues, instruments and participants is highlighted along with the institutional arrangements. This is followed by an articulation of the broad objectives of development of financial markets by the Reserve Bank of India (RBI). The subsequent sections consider the important issues faced by the RBI in the simultaneous development of the debt and money markets in India, the dilemmas encountered in its role as monetary authority and debt manager, its function as regulator vis-à-vis supervisor of the banking system and its role as regulator of debt markets. The penultimate section discusses the processes adopted in the implementation of reforms in the financial markets. The last section gives the medium-term outlook for debt market reforms.

2. Country context

Until the late 1980s and early 1990s, the pattern of economic development adopted by India was essentially based on a fairly centralised approach to planning with a predominant role for the public sector. The public sector banks and financial institutions, which account for 75-80% of financial intermediation, contributed significantly to the development process, especially by way of captive investments in government securities and substantial lending to the public sector entities. Large statutory pre-emptions and borrowing from the RBI enabled the government to meet its borrowing requirements to finance large fiscal deficits. Interest rates on government debt were administered and kept below the market level. The interest rate on central bank financing, particularly through investments in Treasury bills, was concessional and debt monetisation was automatic and unrestricted. In maintaining macroeconomic stability, monetary policy had to counteract the monetary impact of such fiscal operations through successive, large increases in cash reserve and statutory liquidity requirements. Savings, mobilised through government-owned post offices, have been another major source of financing for both the federal (central) and provincial (state) governments. Interest rates were administered for all financial products, including deposits and lending operations in almost all formal and organised sectors. Exposure to external capital flows was confined to multilateral grants and loans to the government sector and, to a small extent, external commercial borrowings mainly by public or state-owned enterprises.

In such a milieu, there was little scope for development of an active government securities market. Most private industry was subject to licensing and, once licensed, it approached development financial institutions (DFIs) for debt finance. The DFIs, at both the central and state levels, had privileged access to financial resources from a captive group of investors. Working capital finance was provided by commercial banks, through an administered mechanism. Financing of agriculture and the non-corporate private sector was mainly through commercial banks and to some extent cooperative banks guided through public policy, though the informal financial sector also played an important role.

In brief, the formal financial sector was to a significant extent characterised by a large demand for funds by government or government-owned or licensed entities and supply of funds from government-owned banks, financial institutions or government-mandated institutions, while pricing of financial

[1] The author thanks K Kanagasabapthy, A Prasad and U Thorat for their assistance.

products and instruments, whether in the public or private sector, was administered. In the early 1980s, however, state-owned non-financial enterprises were permitted to access financial markets for their financing needs, mainly through bonds by way of special borrowing allocations. These bonds were essentially guaranteed by governments and generally funded by government-owned financial institutions and provident funds. Special borrowing allocations were discontinued in the mid-1990s.

The development of the debt market in India was led by the need for the government to raise increased amounts from the market, the encouragement given to financial institutions and corporations to raise funds from a competitive market without any specific borrowing allocations, the need for long-term infrastructure financing and the importance of a liquid debt market in promoting these objectives. Above all, the healthy development of the financial sector in a liberalised and competitive environment is considered an essential prerequisite for capital account liberalisation as it promotes global intermediation and risk-sharing in a more efficient manner.

In order to develop debt markets in an orderly fashion, as an initial condition for efficient price discovery, it was necessary to move away from administered interest rates. This, along with the reduced reliance by government on high statutory pre-emption of banks' resources and automatic monetisation of the deficit by the RBI, were two major areas of focus of reforms in the early 1990s. An important development was the move to an auction system for issuing government securities, which paved the way for market-related interest rates in the government securities market. This enabled the emergence of a risk-free yield curve providing a basis for pricing of other debt securities. The Statutory Liquidity Ratio was reduced to its statutorily prescribed minimum level of 25% in October 1997. The cash reserve ratio, which had reached an effective high of about 16.5%, has been reduced to the current level of 5.5%, close to the statutorily prescribed minimum of 3%. Another significant development has been the elimination of the practice of automatic monetisation of the central government's budget deficit through ad hoc T-bills with effect from April 1997 and the introduction of a new scheme of Ways and Means Advances (a limited financing facility available to central and state governments from the RBI to bridge the temporary mismatches in cash flows). In the 1990s, several other measures were taken by the RBI to create an enabling environment for market development. Prudential norms have been introduced in line with international best practices, banking supervision has been strengthened, transparency and disclosure standards enhanced to meet international standards and risk management practices have been prescribed. In the external sector, capital flows, especially direct and portfolio equity flows, were encouraged, and the exchange rate regime became market-driven with capital controls retained only on external debt and resident outflows. In the real sector, the reforms involved removing/lowering trade and tariff barriers, dismantling industrial licensing and administered prices and opening up the economy to international competition.

In brief, the policy for the development of debt markets has been devised and is being implemented over a period with enabling policies in several related sectors, mainly, though not exclusively, in the financial sector. Given the need to increase the depth in money and government securities markets (so as to improve the transmission channel of monetary policy through indirect instruments), a major focus of the RBI has been on the development of these markets, along with attention to orderly development of the foreign exchange market.

3. The debt market and its institutional arrangements

There are three main segments of the debt market in India: government securities, public sector unit (PSU) bonds and private corporate securities. The market for government securities comprises the central government securities such as T-bills and state government securities. The PSU bonds are generally treated as surrogates for sovereign paper, sometimes due to explicit guarantees and often due to the comfort of public ownership. Some of the PSU bonds are tax-free, unlike most other bonds, including government securities. Private corporate securities include corporate bonds and debentures, which are mostly medium-term papers with maturities up to seven years, and commercial paper, which is a short-term corporate debt instrument with maturities from 15 days to one year. The money market overlaps with the debt market inasmuch as T-bills and other short-term debt papers with maturities up to one year form an integral part of the money market.

The government securities market is the overwhelming part of the overall debt market in terms of both outstanding securities and trading volumes. Nearly 80% of the INR 7,500 billion of outstanding debt securities as at end-March 2001 was accounted for by government securities. Their yields serve as a

benchmark for the financial markets and the RBI increasingly uses them for open market operations. The maturity period of government bonds goes up to 25 years, the average maturity being around eight years. The major investors in government securities are banks, non-bank financial intermediaries, insurance companies, mutual funds and provident funds.

About INR 2,000 billion of corporate bonds are outstanding, with the major issuers being public financial institutions, public sector undertakings and corporations. The maturity period of corporate bonds varies from one to 10 years. To improve the quality of debt issues, all publicly issued debt instruments are required to be rated. The role of trustees in bond and debenture issues has also been strengthened. At present, almost 80% of issues in the non-government debt market are privately placed. Stringent entry and disclosure norms for public issues coupled with lower cost of issuance, ease of structuring instruments and faster procedures have led to the growth of the private placement market in recent years. A significant number of corporate debentures in India are hybrids combining features of both debt and equity. They are liquid and often have floating rates of interest. Government securities are almost entirely held in dematerialised form. While the secondary market activities are subdued, efforts towards dematerialisation since 2000 are seeing increases in turnover.

In the initial years of reform, with the objective of building up institutional and market microstructure, the RBI promoted institutions, inter alia, for developing the money and government securities markets. The philosophy of the RBI has been to promote institutions and then divest its holdings as the markets matured, the strategy being to avoid the problem of moral hazard of the lender of last resort and the conflict between ownership and regulation and supervision. In the process, it promoted the Discount and Finance House of India, to develop the money and T-bills markets, and the Securities Trading Corporation of India, mainly to develop the secondary market for government securities. Over the years, as markets reached progressively higher stages of development, the RBI divested most of its holdings in these institutions. A small portion of equity holdings in these institutions, along with holdings in similar institutions in the financial sector, are still in the process of being divested.

The system of primary dealers (PDs) in government securities was instituted in the mid-1990s, adapting to India's situation similar structures in advanced financial markets to widen and deepen the markets. Primary dealers have been playing an important role in the absorption of government securities in primary issues and providing two-way quotes in secondary markets. PDs underwrite primary issuances of government securities, for which they are paid an underwriting commission. They have bidding commitments and success ratio specifications in the dated securities and T-bills market. To enable them to fulfil these obligations, they have almost assured access to the RBI's Liquidity Adjustment Facility (LAF) and may participate in the inter-bank call money market. Given the requirements of a huge borrowing programme and the need to ensure liquidity and two-way prices in the secondary markets (no short sales are permitted) the PDs continue to enjoy a privileged role. Support to entities such as PDs in the early stage of market development had to be juxtaposed with the need to prevent undue risks being taken by such entities due to the assurance of continued support from the central bank. Capital adequacy for credit and market risks is prescribed for the PDs and monitored closely. As the markets develop, the special standing facilities of assured liquidity at predetermined interest rates for PDs will need to be replaced by market-related supports. PDs, however, would retain their status as principal participants in the primary market and market-makers in the secondary market for government securities.

A system of satellite dealers was simultaneously promoted with the main objective of retailing government securities. Since the system has not been functioning effectively, following a recent review an in-principle decision was taken to eliminate this tier.

More recently, the RBI has initiated measures to set up an electronic trading system and has actively catalysed the setting-up of a Clearing Corporation (CCIL) to act as a central counterparty for more efficient clearing and settlement of transactions in money, forex and government securities markets, including the repos market. CCIL became operational in February 2002. In this case, in view of the maturity already attained in the financial system, the RBI decided to depart from its previous practices, and not to directly promote the CCIL or even hold a minority share so as to avoid even any remote implications of an implicit guarantee by the central bank.

4. The Reserve Bank of India and financial markets

The primary interest of the RBI in the development of financial markets, especially the money and government securities markets, arises out of their critical role in the transmission of monetary policy, especially with the move towards reliance on indirect instruments. The money market is the focal point for the payment and settlement system and the equilibrating mechanism for short-term liquidity flows, with greater linkages with the foreign exchange market. Globalisation requires efficient market integration, in particular of money and foreign exchange markets. The government securities market becomes the focal point for the entire debt market due to the following considerations:

- it is the largest debt market and the fiscal deficit continues to be fairly high,
- it serves as a benchmark for pricing in other debt markets, and
- it provides an efficient transmission channel for monetary policy.

Several initiatives towards the development of money and government securities markets in the 1990s, and especially since 1997, have taken them into a high growth trajectory in terms of depth, liquidity, turnover, participants, instruments, etc. These initiatives have assisted large government borrowings, besides contributing to increasing depth in other debt market segments in recent years.

The growth in the government securities market, however, has perhaps not been adequately reflected in the depth of the market as the main investors continue to be commercial banks, insurance companies and provident funds. Consequently, the retail segment of the market has not developed. At present, many non-bank finance companies and urban cooperative banks are required by law to maintain a certain portion of their deposits in government securities. Although the government's market borrowing programme each year exceeds the requirements of the statutory pre-emptions of institutions, the above institutions are experiencing difficulties in acquiring government securities because of an inadequate distribution mechanism. In order to facilitate this mid-retail segment, a scheme for non-competitive bidding up to a certain proportion within the notified amount has been introduced. Specialised gilt funds have been promoted to provide the ideal vehicle for small retail investors. With the commencement of the CCIL and the national dealing system in February 2002, the technological infrastructure has been in place to facilitate large-scale nationwide retailing.

The RBI is both debt manager and regulator, and the current challenge is to evolve mechanisms by which it encourages the development of the debt market while at the same time crafting appropriate roles as manager of public debt. In that process, the RBI faces challenges, issues and often dilemmas in ensuring the transition process is smooth, stable and less vulnerable to problems such as moral hazard, conflicts of interest and regulatory forbearance and arbitrages. An attempt is made here to trace such issues and experiences.

5. The money market vis-à-vis the debt market

A well functioning money market is critical for the development of the debt market. In addition to the importance of the money market for equilibrating liquidity flows among surplus and deficit units, it is also important for the development of the debt market because it prices liquidity through an inter-bank short-term yield curve. Widening and deepening of the money market received an impetus in the late 1980s after the Chakravarthy and Vaghul Committee reports. An integrated approach to market development initiated in early 1997 encompassing money, government securities and foreign exchange markets provided the impetus for the money market to become a critical vehicle in the transmission channel of monetary policy. Measures relate to phasing out quantitative restrictions and prescriptions and increasingly relating risk-taking to capital, easing barriers to entry and exit, broadening the base of the market in terms of participants to include non-banking entities, and refining available instruments (certificate of deposits, commercial paper, money market mutual funds, T-bills). The debt market in general has developed in sophistication with appropriate regulatory safeguards, such as a delivery versus payment system, improvements in accounting, valuation and disclosure norms, and trading in dematerialised form.

The medium-term objective is to make the call/term money market purely interbank, including primary dealers, while non-bank participants, who are not subject to reserve or other major regulatory requirements, could have free access to other money market instruments and operate through repos

in a variety of debt instruments. The completion of documentation and certain other operational details with regard to repos is critical to keeping up with the announced time schedule and the final phase-out will coincide with the implementation of the real-time gross settlement system (RTGS). The RBI is actively encouraging the market through the Fixed Income Money Market and Derivatives Association of India to prepare the documentation on the lines of the International Swaps and Derivatives Association but to suit the unique circumstances of the Indian market. Introduction of the Liquidity Adjustment Facility has been one of the significant steps in the money market in recent times. It has given the RBI the necessary flexibility for liquidity operations as well as signaling interest rates in the short-term money market. The LAF operations combined with strategic open market operations consistent with market liquidity conditions have evolved as the principal operating procedure of monetary policy of the RBI. Bank Rate remains the principal signaling instrument of the RBI, providing directional guidance, to the extent feasible, to the general level of interest rates. The LAF rates operate around the Bank Rate, with a flexible corridor, as a more active operating instrument for day-to-day liquidity management and steering short-term interest rates. A market for interest rate swaps and forward rate agreements as hedging instruments is growing, although further depth in volume and operations would be desirable.

The absence of a benchmark in terms of an interbank term money market yield curve has been a shortcoming in the Indian money market. A number of measures have been taken over the years, including greater interest rate flexibility for banks, exemption of interbank deposits from cash reserve requirements, reduction in the minimum maturity of deposits, and the phasing-out of non-bank participants from the call money market. The new LAF procedures coupled with discontinuance of assured liquidity support through standing facilities and a reduction in cash reserve requirements are expected to pave the way for banks to take slightly longer positions than overnight or a fortnight and create a robust interbank term money market curve as in advanced financial markets. This is particularly vital to integrating the money and foreign exchange markets.

6. Monetary versus debt management: challenges

The major dilemma has been that, given the huge fiscal deficit and large capital flows, arresting volatility in markets and maintaining macroeconomic stability calls for close coordination between monetary and debt management, with due consideration of both short-term requirements and the need for reform in the medium term. The challenge has been to move over gradually to an environment where the RBI divests its function as a debt manager and will operate only in the secondary market for government securities.

Given the size of the government deficit, debt management policy aims at completing government borrowing in a cost-effective manner and enabling smooth recycling of debt with an appropriate maturity structure. The RBI currently executes the gross borrowing programme, decides the maturity of debt, type of instruments, method of issue and timing of issue of all marketable debt of the government, participates as a non-competitive bidder in all the auctions, subscribes to fixed coupon flotations when necessary, and accepts primary issues on a private placement basis at coupons/prices determined by it.

Combining the roles of monetary management and debt management, the RBI endeavours to balance the objectives in a manner that ensures completion of government borrowing without undue pressure on interest rates but, at the same time, the monetary policy goals of price stability and flow of credit to productive sectors are adequately met. However, there are inherent conflicts in playing this dual role.

Conflicts arose in the pre-reform period since a large part of the deficit was automatically monetised, and the excessive monetisation was reversed by hikes in the cash reserve ratio and SLR and administered interest rate and credit controls. As government borrowing was at below market rates and from captive groups of investors, the government securities market remained totally dormant, rendering indirect instruments of monetary control irrelevant. The active debt management policy pursued during the post-reform period since 1992 has mostly alleviated the fundamental conflicts.

Recently, as the economy has opened up and capital flows begin to dominate, the RBI has had to manage such flows and moderate their impact on the foreign exchange market through both direct interventions and monetary measures. Use of monetary measures, however, implies that there could be a sharp rise in yields on government securities which imposes undue pressure not only on the

interest cost for government but also across the system, as these yields are increasingly becoming the market benchmarks. Where it is perceived that such tightening is temporary, until conditions normalise, the RBI has had to resort to devolvement and private placement of government debt and appropriate open market operations and liquidity management techniques so as to stabilise the interest rates in the entire system. On such occasions, the RBI has also at times "talked down" volatilities in exchange or interest rates through press statements. For example, in June 1998 the RBI announced its readiness to sell foreign exchange to meet supply-demand mismatches. In May 2000, it indicated its readiness to meet foreign exchange requirements on account of crude oil imports and government debt service payments. After the 11 September 2001 events, it announced that it did not intend to shift its monetary policy stance of keeping interest rates stable with adequate liquidity.

The coordination between monetary and fiscal policy is desirable, but it is also important that the monetary authority is not burdened with functions that may conflict with its specific mandate. The RBI is the debt manager for both the central and state governments. So far, management of the liquidity and interest rates in the context of large government borrowings has necessitated the RBI's participation in the primary market through private placement as well as devolvement and subsequent unloading of securities through open market operations when liquidity conditions are favourable. With the opening-up of the economy, monetisation of the deficit has to be weighed against the monetary impact of capital flows and the liquidity needs of the commercial sector. Against this background, separation of debt management from monetary management has, therefore, been proposed. The existing statute makes it mandatory that the debt management function is undertaken by the RBI. In the monetary policy statement of April 2001, the RBI acknowledged that although it is desirable in principle, separation of the debt and monetary management functions is a medium-term process that is dependent on the fulfilment of three conditions; development of financial markets, reasonable control over the fiscal deficit, and necessary legislative changes.

7. Challenges in liquidity management

The major dilemma relates to ensuring adequate liquidity in the context of developing the government securities market, given the continued high fiscal deficit, fiscal slippages, large ways and means advances and capital flows, all of which affect liquidity management. While monetisation of the government deficit could provide primary liquidity to the market, liquidity creation could also take place through other channels, such as the central bank enlarging its holding of foreign currency assets, expanding its lending to the commercial sector, and conducting open market operations divested from the government's budgetary considerations.

Liquidity in the government securities market, especially in the short-term T-bill market, is of critical importance in the move towards indirect instruments of monetary policy. The secondary market in government securities is quite active with annual turnover of four times the outstanding stock of securities. The repo market is growing in volume and the number of participants and variety of instruments are increasing, except in the overnight call market. However, the short-term yield curve is yet to emerge. There are several reasons for this. There are large unpredictable and volatile government cash flows which are accommodated by a standing Ways and Means Advances facility from the RBI and a system of cash credit for withdrawals requires banks to be prepared for large and sudden deposits or withdrawals by large corporate customers. A system of short-term asset/liability management is yet to be fully developed in terms of monitoring and adherence to the tolerable levels of mismatches. Finally, there is a continued orientation towards longer-term fixed rate products. Even the repo market is mostly on an overnight basis and there are few longer-term repos. Term money volumes are also much smaller than for overnight money. Measures such as longer-term repos by the RBI have been introduced to develop the short-term yield curve. The constraints faced are also related to more active management of cash and debt by the government agencies, public sector bodies and corporates.

The development of the repo market, on sound lines with transparency and DvP, facilitated the introduction of the LAF in 2000. It has become the most important tool for management of short-term liquidity and facilitating the transmission mechanism from the short end of the term structure to the longer end and to other debt instruments, which use the short-term rates as a benchmark. The replacement of the RBI's standing facilities with assured rates by using the LAF for absorbing/injecting short-term liquidity will further ensure the efficacy of targeting short term interest rates.

While recognising that intervention in the price discovery process can distort and stunt the development of markets, during the transition period from completely administered rates to market-determined rates, the RBI has had to consciously moderate sharp movements in yields that could emerge in the auctions by accepting devolvement wherever felt necessary. This is necessary as the markets are still developing and large segments of savers and investors do not participate in the debt markets. On some occasions, either due to sudden, large increases in the government's requirements or sharp volatility in other markets such as foreign exchange markets, part of the government's borrowing needs to be absorbed through private placement with the RBI and the securities subsequently offloaded through open market operations when conditions are more conducive. This is essentially a intra-year smoothing process for managing liquidity and avoiding too sharp a movement in yields.

The events of 11 September 2001 have clearly demonstrated the need to ensure liquidity in the markets to arrest undue volatilities. The RBI stepped in to provide liquidity to the market across the spectrum of the yield curve without taking on the role of a market-maker itself. The operations were gradual, in a phased manner and through auctions appropriately pricing securities in tune with the market bids.

Developing deep and liquid secondary markets in government securities has been the main objective of the RBI in the recent period. To that end, the RBI has initiated legal, regulatory and taxation reform, infrastructure and technology improvement, safe settlement systems, and market dissemination of information on all trades in the wholesale market. It also improved methods of issuance such as reopenings and price-based auctions thereby improving fungibility, introduced derivatives such as interest rate swaps and enlarged the repo markets. Liquidity support facilities to the primary dealers and timely open market operations have also been felt necessary to prevent the drying-up of liquidity in the secondary markets. In all these areas, the dilemmas have been resolved through a phased sequencing towards a clear ultimate objective.

8. Bank regulation and supervision and debt markets: dilemmas

Major policy issues in this regard relate to valuation norms for debt instruments, putting in place asset liability management, insisting on sophisticated risk identification and measurement systems, enabling a liquid secondary market for central and state government securities as well as non-government debt, etc. Given the SLR requirements and the current preference of banks to hold government debt, the maturity profile of new debt issues is carefully calibrated, allowing for the asset-liability mismatches of banks on account of long-dated debt instruments and the related interest rate risk, the bunching of maturities and the preferences of other players such as insurance companies and provident funds. In fact, with the progress achieved in the money market and T-bill market, it has been possible to evolve a credible benchmark rate facilitating launch of a floating rate government bond linked to the 364-day T-bill.

The Indian banking system's assets and liabilities are still largely based on original contractual obligations and by and large are not securitised. This is particularly so on the liabilities side; the most important funding source is deposits from households. On the assets side, the investment portfolio (government and non-government debt), which is becoming more dominant, accounts for almost half of total assets. The regulatory and supervisory reforms in the initial stages focused more on credit risk and on the prudential recognition of income, classification of loans and adequate provisioning in line with international norms.

Regarding investments in government securities, the initial concern was to recognise in a phased manner the marked-to-market (MTM) losses on the earlier investments acquired at low and below market yields. This was achieved in a gradual manner by making it mandatory for banks to MTM initially 40% of their investment portfolio (1994), with the proportion raised in stages to 75%. This is consistent with the move towards international best practices. Banks now divide their investments into three categories; core (those held to maturity), available for sale, and held for trading. Banks are permitted to classify up to 25% of their investments in the "held to maturity" category, which is exempt from the MTM requirement. The unrealised gains on the "available for sale" category is not recognised while depreciation is provided for. This move to MTM has enabled banks to be more active in managing their investment portfolio. Currently, banks are holding almost 35% of their assets in government securities.

The concern of the authorities has now turned to the liquidity and market risks of these investments, especially as interest rate movements are more volatile, particularly in response to external factors. The interest rate risk, however, is a matter of concern as most of the banks' liabilities are short-term (up to three years) while the duration of their government securities is increasing because of the elongation of the maturity profile of government debt. The LAF has minimised the liquidity risk on these assets. Banks are being sensitised to the need for building up investment fluctuation reserves to guard against adverse movements in interest rates. Interest rate swaps are permitted, but are yet to take off in the longer-term segment. STRIPS are being introduced and are expected to enable banks to undertake better asset/liability management. Other hedging instruments such as interest rate futures and options are being examined for their market, regulatory and policy implications. Sensitisation of the boards of banks to best practices in risk management has been accorded a high priority.

The corporate bond market has grown over the years and currently accounts for about 15% of banks' assets. In the corporate bond segment, the RBI's concern, as a supervisor, has been the large number of private placements/unlisted bonds where the disclosure and documentation standards may be less than satisfactory. As the major investors in such bonds are banks and financial institutions, the RBI has taken an active interest in introducing uniform and prudential norms for their classification and valuation. This has led to better disclosure, requiring the boards of the banks to have a conscious policy of limiting their investments in unrated and unlisted bonds and taking suitable risk containment measures. A major dilemma faced in the reform of this market was that, with the Securities and Exchange Board of India (SEBI) being the regulator for corporate bonds, and in view of certain legislative constraints, the RBI preferred the route of directing major investors such as banks and financial institutions under its supervisory framework to invest and hold commercial paper, bonds and debentures only in dematerialised form. This directive has brought about the necessary transparency and enabled monitoring of privately placed and unlisted debt instruments. As recently as October 2001, the RBI followed this up with comprehensive guidelines on investments by banks and financial institutions in the private placement market for debt instruments.

The availability of sovereign guarantees, especially at the state level, has also facilitated the issuance of large amount of bonds where due diligence may not be sufficiently exercised. This is an area where the RBI has been cautioning the state governments about the need for fixing a ceiling on guarantees and also cautioning the banks and the financial institutions about the need for proper appraisal and monitoring of projects especially in the infrastructure sector. Given the sensitivity of political leadership at the state level, the RBI appointed a committee of state finance secretaries, which recommended the imposition of a legislative ceiling on guarantees. Further, the demonstration effect of a few state governments imposing limits on guarantees has been felt by many other states.

9. The Reserve Bank of India as a regulator of debt markets: dilemmas

The regulatory responsibility for the securities market is vested in an overlapping manner among the RBI, SEBI, Department of Company Affairs, Department of Economic Affairs and the Ministry of Finance. The regulatory jurisdiction between the RBI and SEBI was clarified by an amendment to the Securities Contract Regulation Act in 2000 which gave RBI the regulatory jurisdiction over the money and government securities markets and SEBI jurisdiction over the corporate debt markets.

With the increasing integration of the financial markets, there are more instances of the same participants coming under the purview of multiple regulatory bodies. These features have raised the potential for regulatory gaps and overlaps, thereby underpinning the need for greater coordination among various regulators. A major dilemma here is between regulating entities and regulating activities. Major entities in the government securities markets such as the insurance companies, the mutual funds and the provident funds are outside the regulatory purview of the RBI, although it is the regulator of the government securities market. Stock exchanges on which government securities could be traded are under the purview of SEBI. On the other hand, there is a regulatory gap as regards the private placement of debt. Coordination mechanisms are required for resolving these dilemmas. Any move to regulate the private placements market has to be made with minimum impact on the balance sheets of banks and financial institutions and the transition should be gradual. At present, formal consultations among domestic regulators are undertaken through the High-Level Committee on Capital Markets comprising the RBI, SEBI, the insurance regulator and the Finance Ministry.

In the context of the work relating to international financial standards and codes, an Advisory Group on Securities Market Regulation has evaluated the existing regulatory framework using the principles laid down by the International Organisation of Securities Commissions and pointed out important issues and lacunae that need to be addressed. Some of these issues relate to giving legal status to the HLCCM constituting self-regulatory organisations (SROs) for mutual funds, giving necessary enforcement powers to regulatory bodies under Securities Commission and Regulatory Authority, etc.

While the RBI promotes, recognises, encourages and interacts closely with SROs such as Primary Dealers Association and Fixed Income Money Market and Derivatives Association for purposes of evolving best practices, it does not provide them with delegated regulatory functions, since they are rightly not recognised as an integral part of the regulatory process under the umbrella of a regulatory system. Another dilemma was whether RBI should be actively involved in boards of institutions such as Clearing Corporation Ltd. The issue was resolved by keeping RBI as a special invitee.

Contract enforcement has been another area in need of special attention. Outdated laws and legal procedures not only create uncertainties for the lenders but also lead to higher costs for the borrower. Laws on stamp duty, registration of assets and taxation would impose additional costs to the system and there is a need to rationalise these in terms of the benefits on account of revenue generation vis-à-vis the costs to the financial system in terms of higher transaction costs and market inefficiency. The debt markets would no doubt benefit from securitisation of debt. While some headway has been made with regard to mortgage securitisation, a number of legislative measures are required and have duly been suggested to the government.

10. Implementation processes in financial markets reform

The general approach to financial sector reform in India is a transparent, collaborative and consultative process which helps resolve very many possible dilemmas. The reform process itself is characterised by caution with a tilt towards preserving stability, careful sequencing of measures, mutually reinforcing monetary measures and ensuring consistency and complementarity with other policies. Further, reform in this market has always been undertaken within the overall monetary policy framework and is coordinated with reforms in money and foreign exchange markets. Many of the major reforms have been implemented in phases, allowing for transition so as not to destabilise market conditions or any group of participants or the financial system in general.

The entire process of structural reform has been facilitated through a collaborative approach imparting transparency of intentions. Before finalising important policy changes, especially on operational aspects, draft guidelines are circulated as consultative papers to market participants and their comments are given due consideration before issuing final guidelines. The RBI and the government have closely coordinated on all major issues. At an overall policy level, this involves, inter alia, legislative changes and regulatory coordination. A working group on cash and debt management consisting of senior officials from the RBI and the government helps the process of consultation in the management of government debt. In fact, the RBI has initiated a process of periodical meetings with state finance secretaries which has helped treasury management as well as debt management operations at the state level. A formal consultative mechanism with market participants established by the RBI through the Technical Advisory Committee on Money and Government Securities Markets ensures technical discussions on important proposed policy and operational changes. The Technical Advisory Committee also appoints working groups from time to time to examine more closely the technical and analytical details of policy proposals. This Committee has representation across the spectrum of the financial market. The RBI also holds separate consultations with the Primary Dealers' Association on important issues concerning the money and government securities markets. At an operating level, there is a Financial Markets Committee in the RBI that is responsible for guiding day-to-day management of market liquidity.

At the same time, in the actual announcement of monetary measures or open market operations, or changes through repos affecting prices or sentiment in financial markets, an element of surprise has been invoked as appropriate. In fact, in the face of considerable uncertainties in the domestic and international financial markets, several unorthodox measures have been adopted. However, in all cases, the framework of uncertainties and the logic of actions, including the dilemmas faced, have been articulated, either at the time or in later policy announcements.

Coordination with SEBI is ensured both at a policy level and at operational level. In particular, at a policy level coordination is ensured through a High-Level Committee on Capital Markets presided over by the RBI Governor, and at an operational level through a technical group of officials, both of which include nominees of the Ministry of Finance. International best practices are constantly reviewed in interdepartmental working groups within the RBI before designing and implementing changes. In all these processes, the interests of investors and intermediaries are kept in view and these include a liquid market to facilitate easy entry and exit, tools for hedging, transparency in operations, an efficient settlement system, an enabling legal environment, and a clear and simple, but robust, regulatory framework. Development of technological infrastructure is at present being given the highest priority to facilitate these objectives.

11. Outlook

The outlook for developing debt markets depends on the pace of the following reforms:

- Further improvements in the money market with the call money market being a pure interbank market, and the CCIL, NDS and RTGS firmly in place. It may be possible to achieve this in about two years.
- The market for government securities having a greater retail base and being more transparent, efficient and liquid with CCIL, NDS, PDO computerisation and RTGS in place, in the next two to three years.
- Separation of the debt management function from the monetary authority, conditional on the passage of the Fiscal Responsibility and Budget Management Bill in parliament. The separation is possible in the next three to five years, assuming improvements in the overall fiscal situation.
- The regulation of debt markets coming under a single regulator like SEBI. The RBI would then be essentially regulating the money market. At that point of time, enabling legislative amendments would be required.
- No firm policy decision on the separation of banking supervision from the RBI is envisaged in the foreseeable future. The choice between single and multiple regulator is a larger issue and an appropriate model will have to evolve over a period.
- Further steps in capital account liberalisation will depend on the efficiency of the banking sector and the health of financial markets. With the reforms envisaged fully in place, conditions in the financial sector should eventually be suitable for opening up the capital account, though currently a definitive time frame cannot be visualised.

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The importance of a well developed bond market - an Israeli perspective

Meir Sokoler

1. Introduction

Well developed tradable debt securities are important for three main reasons:

- increasing the competitiveness and efficiency of the financial system, which in Israel is dominated by a few large banks;
- enhancing the stability of the financial system by creating alternatives to banks, thus reducing their relative power and the related moral hazard problems; and
- serving as a means of two-way communication between policy-makers and financial markets, and through them with the public at large.

This paper discusses these three roles as they relate to the current functioning of the Israeli financial system.

2. Competitiveness and efficiency

Financial intermediation in Israel is at present dominated by a large few banks. This is evident, for example, in the high proportion of bank loans in total financial resources available to businesses and households (Table 1).

Table 1

Financing of the private sector

(% shares)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001e
Credit from banks in Israel	71	74	90	96	87	78	82	72	69	86
Capital raised abroad	6	3	0	1	10	10	6	19	13	9
Capital raised in Israel	23	23	10	3	3	12	12	9	18	5
Total (billions of shekels)	22	41	56	78	60	64	80	73	75	

Private sector fund-raising outside the banking system through the issuing of shares is rather limited and the corporate bond market is minuscule. The main competition to banks for the public's savings comes from government bonds. Despite the large outstanding government debt (about 95% of GDP in 2001), the government bond market suffers, for various reasons, from liquidity problems. In contrast to the interest of foreign investors in Israeli shares, particularly those that are traded on the Nasdaq, there is almost no interest in domestically issued Israeli bonds.

Developing viable alternatives to bank finance in Israel will help in promoting balanced growth. The Israeli economy has been undergoing structural change, notably an increase in the weight of the advanced high-tech sector, with its relatively easy access to sources of finance such as venture capital and international capital markets. This underscores the need to develop sources of non-bank finance for the other sectors of the economy so that they too can grow.

3. Enhancing the stability of the financial system

Developing a viable bond market in Israel will also enhance the stability of the financial system. When firms can raise funds by issuing bonds, they are less dependent on banks, less exposed to difficulties in the banking system and less vulnerable to the adjustments that banks need to make, including those required by bank supervisors. When banks know that they do not have a captive audience because firms have alternatives, they may improve their internal supervision. Having alternatives to banks may therefore result in a more sound banking and financial system.

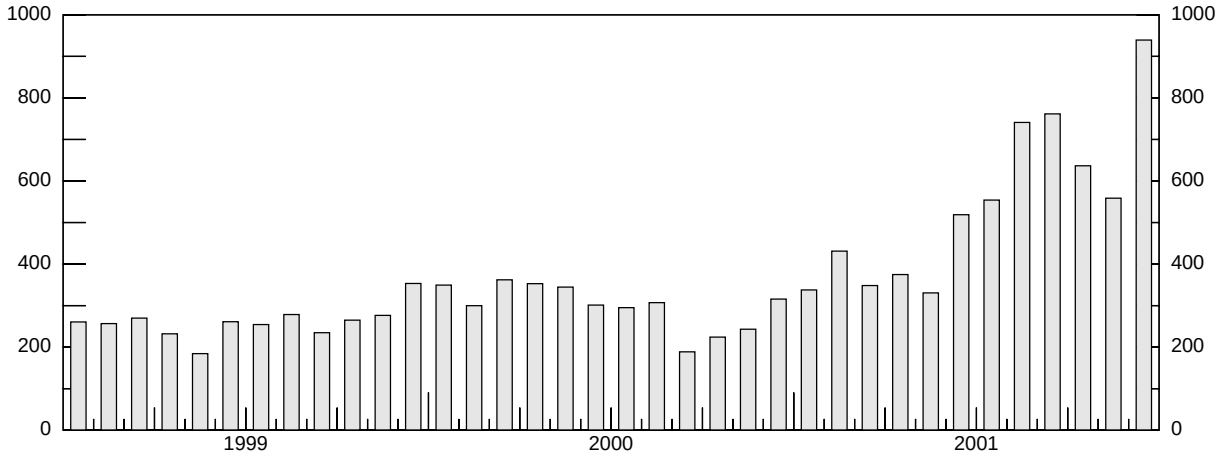
Another way in which a well developed bond market contributes to the stability of the financial system is through its positive effects on the development of securitisation. A more efficient diversification of risks can result from securitising mortgages and other receivables such as credit card payments. This in turn enhances the stability of the banking and the financial system as risk becomes more transferable to those ready to bear it.

In addition, in mature capital markets with a range of bonds of various types, it is easier to mark to market. This in turn means that trouble spots in the financial system can be detected earlier. At present Israel is still very underdeveloped in the above respects. There is no market for mortgage-backed securities nor any securitisation of other types of loans. Mortgage banks sometimes sell some mortgages to provident funds but on a limited and infrequent basis.

An important infrastructure for the private bond market is a well functioning government bond market. The outstanding stock of government bonds in Israel is 178 billion shekels, about 38% of GDP. Net issuance of government bonds in 2001 amounted to 16 billion shekels. The rest are non-tradable bonds issued to pension funds, thus creating a situation where a potentially important player is effectively circumventing the capital market.

Graph 1
Government bonds: average daily turnover1

In millions of shekels



[1] On and off the Stock Exchange.

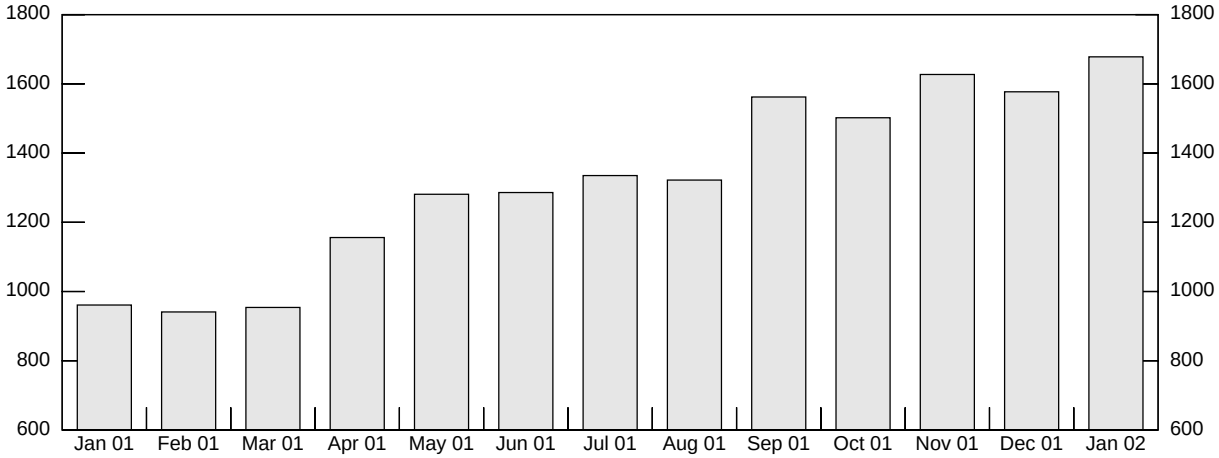
Despite this deficiency, and others, the liquidity of the government bond market has been improving in recent years. Daily turnover of government bonds traded on the Tel Aviv stock exchange increased markedly in 2001 (Graph 1) and so have short positions (Graph 2).

Reducing the number of series and concentrating on benchmark maturities of five and 10 years for the fixed rate nominal bonds, 10 years for variable rate nominal bonds and 10 and 20 years for the CPI-linked bonds improved the functioning of Israeli bond markets. Furthermore, the size and composition of the government bond auctions are now announced a month in advance.

Graph 2

Short selling of government bonds

End-month balance, in millions of shekels



A cornerstone of a mature capital market is the ability to conduct repo operations (secured lending). There are currently no central bank repo operations in Israel, but a legal obstacle has recently been removed. The ceiling limiting the issue of short-term government notes (which are legally designed only for monetary policy purposes and whose proceeds cannot be used to finance the government deficit) to an amount updated twice a year by the rate of increase in M1 during the previous half year was removed. This is a welcome development as central bank repo operations serve as an important benchmark for such operations in the private sector, which in turn provide an alternative finance source to banks.

4. Signal to policymakers

There have been two recent examples where bond markets have served as important "warning lights" concerning problematic macro policies. In 1996 the government deficit in Israel grew much faster than originally planned at a time when inflation expectations were above the inflation target. The government decided to cut expenditures and, based on this decision, asked the Bank of Israel to ease its monetary stance. The central bank's response was that the decision to take the corrective fiscal measures was certainly an important step in the right direction, but it was also important to see how credible this decision was from the point of view of financial markets. In particular, it was important to see how the market's inflation expectations responded to the government decisions. These expectations are derived from the difference between yields on regular nominal bonds and CPI-indexed bonds with the same maturity. Both types of bonds are traded regularly in a relatively well developed market. These inflation expectations are an important element in the monthly monetary policy decisions of the Bank of Israel.

The slump in economic activity in 2001 resulted in much smaller tax receipts than expected, a much larger deficit than planned and hence much larger government financing needs. The government originally planned to raise (net) about 3 billion shekels in 2001 but ended up raising more than 16 billion. This obviously affected the long-term rate, which also serves as a benchmark for the mortgage market. Those yields rose from around 4.3% to around 4.9% in the third quarter of 2001. The existence of developed government bond and mortgage markets was very important in making the point that the government decision to accept the larger deficit (the automatic stabiliser argument) had immediate consequences in the mortgage market. In an important sense the "bill" to the government was "presented" immediately.

Structural change in the corporate bond market in Korea after the currency crisis

Sungmin Kim and Jae Hwan Park[1]

1. Introduction

Before the currency crisis, local bond markets in Korea, in particular those for government and government-guaranteed bonds, were not well developed as the government had not run a large fiscal deficit for some time. However, the corporate bond market had begun to grow in the early 1970s. Most corporate bonds carried guarantees from banks, securities houses or guarantee funds. In view of the small scale of issuance of government bonds until recently, the yield on the three-year corporate bond was taken as the benchmark bond yield.

Since the currency crisis in 1997, however, there has been remarkable growth in the size of the local bond market, together with structural changes. This growth reflects the following factors. First, since the government urgently needed to raise a huge volume of public funds for financial restructuring, as well as boosting the depressed economy by fiscal pump-priming, it had the urgent task of creating a well developed government bond and government-guaranteed bond market. Second, the Bank of Korea (BoK) had to issue a huge volume of monetary stabilisation bonds (MSBs) to absorb the expansionary effects of the rapid increase of its foreign reserves. Thirdly, the corporate sector had to raise more funds from the corporate bond market since financial institutions in the throes of financial sector restructuring were very reluctant to extend loans to the corporate sector. Finally, a huge amount of asset-backed securities (ABSs) needed to be issued during the restructuring of both the financial and corporate sectors. Consequently, as of the end of 2001, the total outstanding volume of bonds issued has doubled to 480 trillion won from 223 trillion won at the end of 1997 (Table 1).

Table 1

Outstanding volume of bonds in Korea

(end-year, in trillions of won)

Issuer	1997	1998	1999	2000	2001
Government	28	42	62	71	82
Central bank (MSBs)	24	46	52	66	79
Corporations	90	123	120	134	154
Agencies	38	80	103	108	140
Financial institutions	39	43	36	36	34
Local governments	3	3	3	3	3
All issuers	223	336	374	419	480
(% to GDP)	(49%)	(76%)	(78%)	(81%)	(88%)

At the same time, the structure of the primary market, the secondary market and the market infrastructure, especially in the case of the government bond market, have changed substantially in

[1] Head of Bond Market Analysis Team and Director-General of Financial Markets Department of the Bank of Korea respectively. The views expressed are those of the authors, and do not necessarily reflect those of the Bank of Korea.

the wake of the crisis. The government has aimed to develop the bond market following the active issuance of Treasury bonds since September 1998. In addition, after their introduction in late 1998, the issuance of ABSs has become very popular, and increased dramatically from 1999 during the restructuring of both the financial and corporate sectors. Furthermore, because of financial institutions' reluctance to provide credit guarantees for corporate bond issuance right after the currency crisis, the majority of corporate bonds have been issued in non-guaranteed form since 1998.

There have been frequent outbreaks of turmoil in the corporate bond market,[2] especially associated with debt rollovers following the collapse of the Daewoo Group in July 1999, while the development of the government bond and ABS markets has been generally very successful without giving rise to any serious problems. The problems in the corporate bond market caused by the liquidity troubles of investment trust companies (ITCs) prompted numerous measures by the authorities, including structural measures to reform and support ITCs and the establishment of a "bond market stabilisation fund" with contributions from banks during the period from mid-1999 until mid-2000. Subsequently, the difficulties experienced by lower-rated firms in rolling over their maturing debt prompted a further set of measures from mid-2000. Primary collateralised bond obligations (P-CBOs) were introduced, with partial credit guarantees by government-owned guarantee funds. A "Bond Fund" was established with capital contributions from 15 banks and other institutions for purchasing P-CBOs. The "Korea Development Bank's prompt underwriting scheme" to support the rollover of maturing bonds of larger firms having temporary liquidity problems was established. However, it is fair to say that most of the measures taken to stabilise the corporate bond market have been stopgap in nature, taken in response to turmoil in the market.

Against this backdrop, this paper explains recent developments in the local bond markets and policy responses after the currency crisis, with a primary focus on the corporate bond market, and draws policy implications based on these recent Korean experiences. Recent developments in the corporate bond market and policy responses are discussed in Section 2. Section 3 assesses the current status of the market with a primary emphasis on causes of recent problems. Some tentative conclusions and policy implications are drawn in Section 4.

2. The corporate bond market and policy responses after the crisis

In describing the recent development of the corporate bond market, we can divide the period since the currency crisis into three phases. During the first phase, from end-1997 to June 1999, corporate bond issuance surged in the aftermath of the crisis and the structure of the corporate bond market changed swiftly from a predominance of bonds guaranteed by financial institutions to a predominance of non-guaranteed bonds, due to a huge surge in fund inflows to ITCs, particularly bond-like beneficiary certificates. During the second phase, from July 1999 to June 2000, the liquidity conditions of the corporate bond market deteriorated sharply, as the collapse of Daewoo Group in July 1999 raised investors' concerns as to the soundness of beneficiary certificates in ITCs, which consequently suffered huge withdrawals. During the final phase, from July 2000 until quite recently, financing conditions in the corporate bond market tightened considerably, reflecting the greater investor sensitivity to corporate credit risk in the face of a sharp downturn in economic growth and the overhang of bonds issued in 1998 or earlier approaching maturity.

Phase 1: Boom in corporate bond issuance

As mentioned earlier, in the aftermath of the crisis in 1997, the corporate sector needed to raise more funds from the corporate bond market, as financial institutions in the throes of financial sector restructuring became extremely reluctant to extend loans to the corporate sector. At the same time,

[2] More specifically, following the collapse of Daewoo in mid-1999, financing conditions in the corporate bond market deteriorated sharply, reflecting investors' greater sensitivity to credit risk and the huge withdrawal of funds from ITCs, the prime investor in corporate bonds, which experienced large losses associated with their vast holdings of dishonoured bonds issued by Daewoo.

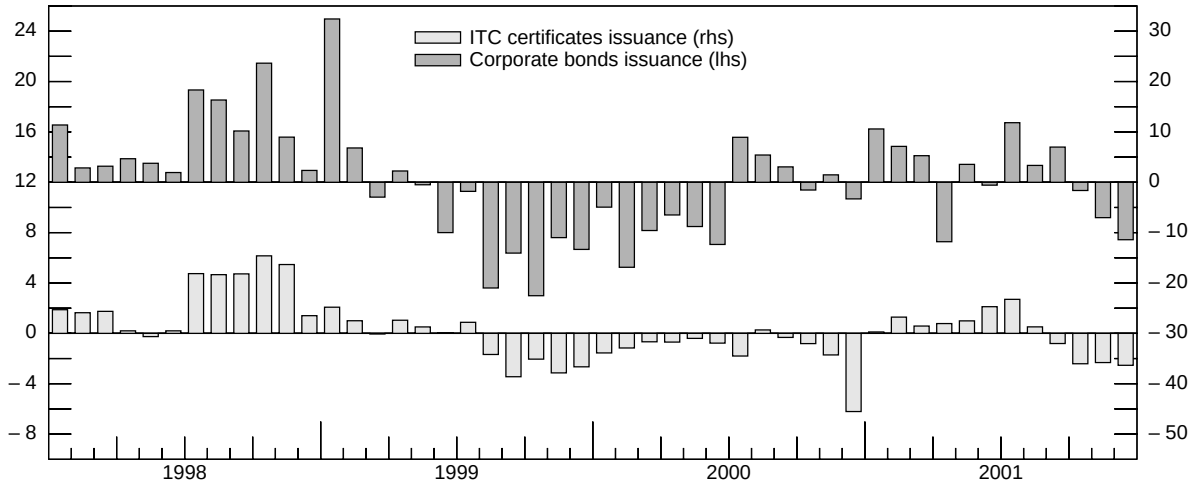
because of financial institutions' reluctance to provide credit guarantees for corporate bond issuance, the majority of corporate bonds had to be issued in the form of non-guaranteed bonds.

Faced with these problems, the government raised the ceiling on an individual firm's corporate bond issuance from double its equity capital to four times its equity capital and eliminated any restrictions on investment in domestic bonds by foreigners in late December 1997. While the initial impact of these measures was not significant, market-driven factors made it possible for the corporate sector to raise funds on a vast scale by issuing non-guaranteed bonds, as interest rates declined sharply after their peak in mid-February 1998. With this abrupt downturn in interest rates, there was a huge surge of funds to ITCs, particularly their beneficiary certificates, which were expected to provide more attractive yields. In fact, funds placed in these certificates increased from 62 trillion won at the end of 1997 to a peak of 190 trillion at end-May 1999. As the ITCs therefore had more money to purchase corporate bonds, it was possible for many firms to issue large quantities of non-guaranteed bonds, resulting in a swift shift of the structure of the corporate bond market to one dominated by non-guaranteed bonds.

Graph 1

Net issuance of ITC certificates and corporate bonds

In trillions of Korean won



Nevertheless, it is far from clear why investors, in the face of ongoing financial sector restructuring, invested such a huge amount of money in ITCs, even though such deposits are not protected by deposit insurance. Although there are many different explanations for this, it appears to reflect, to a large extent, a combination of sharply declining interest rates from the second quarter of 1998 and the maintenance of the principle of historical cost valuation in accounting for assets. Under this accounting principle, the beneficiary certificates were expected to provide more attractive returns due mainly to possible capital gains associated with declining interest rates. It also seems attributable to a widely held view among market participants at that time that restructuring of the ITCs would be implemented as the final stage of financial sector restructuring. In addition, the fact that some chaebol appeared to rely on ITCs affiliated with their groups to buy their bonds regardless of risk was another contributing factor, to a certain extent.

Consequently, there was massive issuance of corporate bonds in 1998 and early 1999, primarily three-year bonds but also some with shorter maturities. With only a modest amount of corporate bonds maturing, net issuance of corporate bonds in 1998 was 33 trillion won. Thanks to this huge net issuance, the proportion of funds raised from the corporate bond market in the total borrowings of private enterprises increased to 22% in 1998 and 21% in 1999, from 17% in 1997, while that of borrowings from financial institutions declined to 41% in both 1998 and 1999 from 43% in 1997.

Graph 2

Corporate bond yield and net issuance of ITC certificates

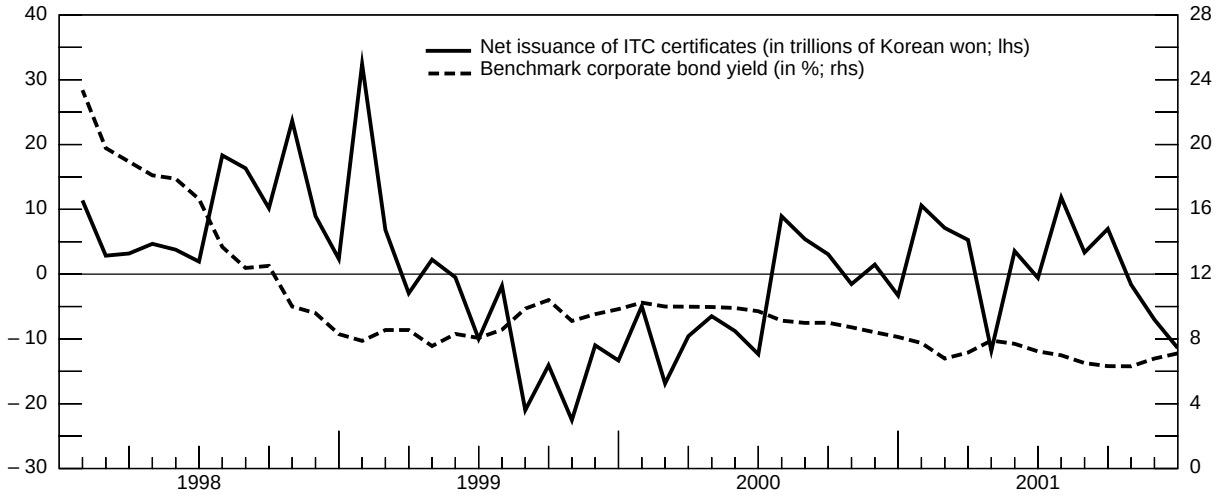


Table 2

Financing by private enterprises

(end-year, in trillions of won)

Sources	1997	1998	1999	2000	2001
Loans from banks	150	148	162	177	192
Other loans	161	143	127	130	144
Corporate bonds	121	158	148	124	180
Commercial paper	69	56	40	34	44
Other	225	204	227	271	268
Total	726	708	705	736	828

Source: Bank of Korea.

Although the corporate bond market contributed to easing the financial pressure on the corporate sector in the face of the credit crunch in the bank loan market, this kind of easy access to the corporate bond market offered by huge surges into ITCs also generated some adverse effects, notably hampering the progress of corporate restructuring. First, large chaebol could use the corporate bond market as a safety valve to ease restructuring pressure. More specifically, since chaebol could raise huge amount of funds from the corporate bond market easily, they had less incentive to restructure themselves than would otherwise have been the case. Some chaebol, especially Daewoo Group, kept expanding the scope and scale of their business by using the vast funds raised from the corporate bond market, even after the crisis. Second, since it was possible for various non-viable large companies, by raising funds from the corporate bond markets, to show sudden improvements in their liquidity conditions, some were able to survive, resulting in a further delay of corporate restructuring.

In response to these potentially adverse effects associated with easy access to the corporate bond market by large firms, the government implemented some measures to limit their excessive issuance of corporate bonds. More specifically, with effect from October 1998, the government imposed a temporary ceiling on purchases of corporate bonds issued by member companies of several conglomerates on the part of banks, ITCs and insurance companies which were subsidiaries of the same conglomerate. The financial supervisory agency also exercised moral suasion to guide the debt-to-equity ratios of the chaebol below 200% by the end of 2000.

Phase 2: the crisis of investment trust companies

The favourable conditions of the corporate bond market, which had persisted since mid-1998, underwent a complete turnaround after the collapse of Daewoo Group, the third largest chaebol, and the associated liquidity problems of the ITCs in mid-July 1999. Specifically, since the ITCs experienced large losses associated with their vast holdings of dishonoured bonds issued by Daewoo, which raised investor concerns over the ITCs' soundness, the collapse of Daewoo triggered a huge withdrawal of funds from ITCs, leaving them with severe liquidity problems. The funds in the ITCs' beneficiary certificates decreased sharply, from 179 trillion won at the end of June 1999 to 53 trillion won at the end of June 2000.

As their liquidity dried up, the ITCs had to sell marketable liquid bonds in the secondary market, including high-quality corporate bonds and government bonds. This led to substantial rises in bond yields, including those on government bonds. At the same time, it raised new concerns for investors in beneficiary certificates that they might incur larger losses in two ways on their investments if they postponed withdrawals. First, since ITCs tried cherry-picking by selling the most marketable and liquid bonds to meet withdrawals, certificate holders became concerned that their asset quality could deteriorate, leaving a higher proportion of non-marketable junk bonds as time went by and incurring larger losses for remaining holders. Second, as the secondary market price of bonds declined in line with rising bond yields, ITCs had to sell larger amounts of bonds in order to raise a certain quantity of the funds needed to repay investors. In this situation, these investors became very nervous that they would receive less money if they delayed further. This concern could well have accelerated investors' redemption of beneficiary certificates.

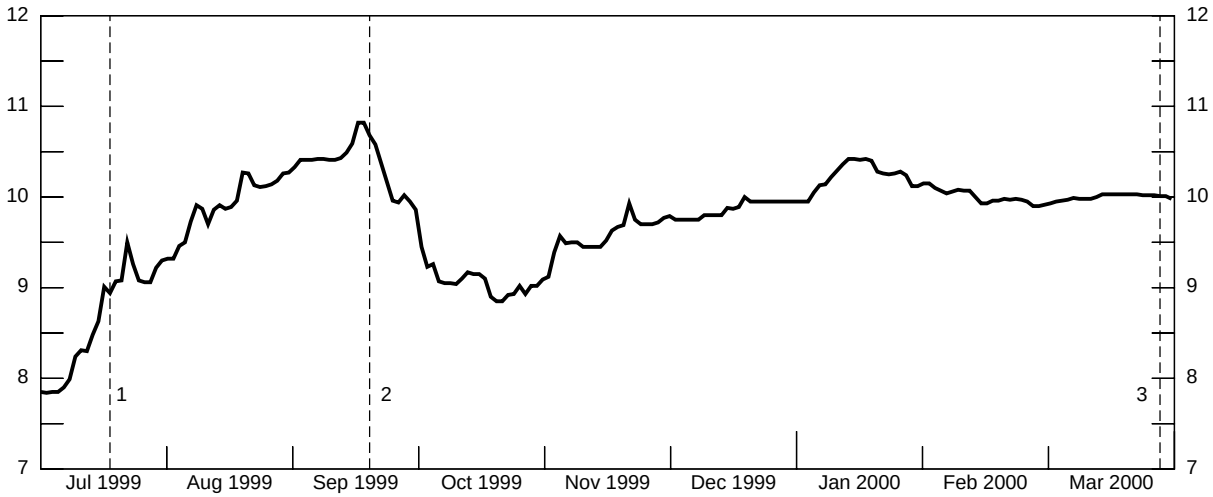
These problems prompted numerous responses by the authorities, with three aims: to stabilise bond yields in the secondary market, to prevent a massive outflow of funds from ITCs and to implement structural reforms of ITCs in order to restore investors' confidence in them.

First, in an attempt to stabilise bond yields in the secondary market, the authorities introduced a "Bond Market Stabilisation Fund" (BMSF) in September 1999. The fund was financed mainly by contributions from banks and insurance companies and its goal was to keep bond yields below a certain level. The amount of funds to be subscribed was initially set at 2 trillion won, but this had to be raised to 3 trillion won by mid-November 1999. The BMSF was initially allowed to purchase Treasury bonds, MSBs and corporate bonds rated higher than BBB-, with the purchase of lower rated corporate bonds permitted after mid-October 1999. The BMSF proved to be very effective in achieving its goals, bringing down the benchmark three-year corporate bond yield from 11% to 9.5%, and yielding profits to its subscribers when it was dissolved in March 2000.

Graph 3

Benchmark corporate bond yield

In per cent per annum



[1] Collapse of Daewoo. [2] Establishment of Bond Market Stabilisation Fund (BMSF). [3] Dissolution of BMSF.

Second, a number of measures were put in place to prevent a massive outflow of funds from the ITCs. A two-pronged approach was adopted: involving discouragement of large-scale redemptions of beneficiary certificates while attracting redeemed funds back into ITCs by introducing new instruments, which were substitutes for the beneficiary certificates. In mid-August 1999, restrictions were imposed in an effort to discourage a sudden and massive wave of certificate redemptions. In principle, financial institutions were prohibited before July 2000 from redeeming early those certificates with exposure to Daewoo. Moreover, redemption claims by individuals and non-financial corporations were discouraged by introducing a scheme of gradually increasing the payout ratio for the portion of Daewoo paper on the surrender of the certificates in line with the length of time they had been held.[3]

Furthermore, in October 1999 the authorities allowed the conversion, upon application by investors, of bond-type beneficiary certificates to equity-type certificates, without imposing any early withdrawal penalty. In addition, funds specialising in investing in corporate bonds with sub-investment grades, which could absorb lower-graded corporate bonds held by ITCs, were subsequently introduced during the period November 1999 to May 2000. The main features of each fund are described in Table 3 below. The funds had some special features to attract investors' interest, including preferential tax treatment and the right to subscribe to a certain portion of initial public offerings listed on either the Korea Stock Exchange (KSE) or the Korean Association of Securities Dealers Automated Quotations (KOSDAQ). Finally, the ceiling of trust-type securities savings managed by three ITCs which offered fixed yield to investors was lifted from 5.2 trillion to 10.2 trillion won in January 2000, in an attempt to lure more funds from investors who preferred financial products providing fixed yields.

Table 3

New ITC products

	High-yield fund	**CBO fund**	**New High-yield fund**
Investment scheme	Over 50% in low-grade bonds (BB+ and below) and low-grade CP (B+ and below). Less than 50% in stocks (less than 30%), investment bonds and other liquid assets.	Over 50% on subordinated CBOs (more than 25%), low-grade bonds (BB+ and below) and low-grade CP (B+ and below). Less than 50% in stocks (less than 30%), investment bonds and other liquid assets.	Over 30% on subordinated CBOs (more than 15%), low-grade bonds (BB+ and below) and low-grade CP (B+ and below). Less than 70% in stocks (less than 30%), investment bonds and other liquid assets.
Duration	6 months to 3 years	6 months to 3 years	1 year to 3 years
Loss compensation provisions	Closed-end funds: up to 5% of principal for individuals. Open-end funds: none.	Closed-end funds: up to 5% of principal for individuals. Open-end funds: none.	None.
IPO allocation scheme	40% of IPO shares in KSE, 50% of IPO shares in KOSDAQ and 60% of rights offering not taken up in initial capital increases are to be allocated to the three types of fund.		
Tax exemption	Tax waiver of 50% of interest income tax on investments up to 20 million won per person.		

There were three main structural reforms for ailing ITCs:

- *Recapitalisation* with either additional shareholder funds or public funds. The two largest troubled ITCs, which did not have major shareholders, were recapitalised through the injection of 7.7 trillion won of public funds.

[3] Specifically, investors could redeem funds whose holdings included Daewoo paper but receive only 50% of the face value of the Daewoo holdings if they withdrew before 10 November 1999, while they could claim redemption of their certificates and receive 80% of the face value of their investments in Daewoo between 10 November 1999 and 9 February 2000. Individuals and non-financial corporations who withdrew their money from ITCs' bond-type funds after 9 February 2000 received 95% of the face value of their share of the investments in Daewoo paper.

- *Cleaning-up non-performing assets*. First, from January 2000, 18.5 trillion won of non-guaranteed Daewoo paper held by ITCs was sold to Korea Asset Management Corporation (KAMCO) at 35% of face value. Second, from February 2000, non-performing assets held by ITCs were securitised as collateralised bond obligations (CBOs) with the senior tranches of these CBOs being sold in the market, while junior tranches were invested as underlying assets of ITCs' High-Yield Funds, New High-Yield Funds and CBO Funds. Specifically, the ITCs issued 20.4 trillion won of CBOs from February 2000 to end-June 2000. Third, the government announced that by June 2000, KAMCO would purchase 1.8 trillion won of ITCs' holdings of commercial paper collateralised by Daewoo Group. Fourth, for Seoul Guarantee Insurance Corporation, which had guaranteed a large share of the Daewoo bonds, the government announced a plan to inject public funds to honour these guarantees. Finally, the ITCs and securities houses which had acted as sales representatives agreed to loss-sharing arrangements. These were based on the proportion of the fee income they had received from the sale of beneficiary certificates.[4]
- *Strengthening the transparency of asset management.* This included the staged mandatory application by July 2000 of the mark-to-market accounting principle for the assets held by ITCs' funds established for bond-type beneficiary certificates. Furthermore, the establishment of three private pricing agents was permitted in June 2000. The asset management sections of ITCs also began to operate as independent entities. In addition, various measures and guidelines were introduced in order to strengthen ITCs' internal risk management systems.

Instability in the bond market caused by the collapse of Daewoo Group and the liquidity problems of ITCs placed a substantial burden on the BoK as regards its implementation of monetary policy. In particular, this increasing uncertainty in the bond market made it very difficult for the BoK to take pre-emptive action to maintain price stability in the face of increasing inflationary pressure in the second half of 1999. Consequently, the BoK had to delay raising its overnight call rate target until February 2000, when the turmoil in the bond market associated with the huge withdrawal of funds from ITCs had subsided. In addition, BoK purchased 1 trillion won of government bonds in its open market operations on 9 November 1999 in an effort to stabilise bond yields. Yields had risen sharply, reflecting the growing uncertainty over the scale of the funds outflow from ITCs after the relaxation of restrictions on the redemption of beneficiary certificates with Daewoo exposure.

Following the implementation of this package of measures, market sentiment improved gradually. Redemptions of beneficiary certificates remained at manageable levels as investors' confidence in ITCs was partially restored. The benchmark corporate bond yield stabilised at below 10%. Therefore, it is fair to say that the measures mentioned were quite effective in resolving the initial problems posed by the collapse of Daewoo Group and the ITCs' subsequent liquidity problems in mid-1999.

Despite the successful resolution of these initial problems, the collapse of Daewoo Group and ITCs' liquidity problems have inflicted long-lasting and profound damage on financing conditions in the corporate bond market. The net issuance of corporate bonds began to shift to net redemption from the second half of 1999. However, this did not cause any serious disruptions in the corporate bond market since the volume of maturing corporate bonds was not large enough to pose serious problems until the second half of 2000.

Phase 3: the crisis at maturity

As mentioned earlier, there had been massive corporate bond issuance in the second half of 1998 and early 1999, primarily in the form of bonds with three-year maturity but also some shorter maturities. Consequently, many corporate bonds needed to be rolled over from the beginning of the second half of 2000. At the same time, financing conditions in the corporate bond market had already deteriorated sharply since the collapse of Daewoo Group and the ITC problems of mid-1999. As the ITCs, which had held a large share of the stock of corporate bonds outstanding, had been hit by heavy losses and large outflows of funds from their beneficiary certificates, new issues of corporate bonds had been

[4] In general, securities houses receive 70-80% of the fee income from the sale of beneficiary certificates, with the remainder going to the ITCs.

very weak with limited appetite on the part of other investors since the second half of 1999. In addition, the deterioration of the liquidity conditions of some chaebol-linked companies (including certain Hyundai subsidiaries) since mid-2000, together with a sharp fall in economic growth, raised investors' awareness of the increasing credit risk of the corporate sector and deepened their risk aversion, resulting in a widespread "flight to quality" in the local bond market.

Consequently, financing conditions in the corporate bond market deteriorated further from the second half of 2000. In particular, firms with lower credit ratings began to face extreme difficulties in rolling over their maturing bonds. In this context, it should be mentioned that the fact that some firms commonly regarded by market participants as non-viable continued to cling on often made the situation even worse, since it became far from easy for investors to distinguish between bonds of good quality for investment purposes and those of dubious quality. Net redemption of publicly offered corporate bonds during 2000 amounted to 16 trillion won, with a heavy concentration in the second half of the year. As can be seen from Table 4 below, the situation was even worse in the case of corporate bonds issued by lower-rated and relatively small firms.

Table 4

Corporate bonds issuance and redemption[1]

(in trillions of won)

	1999	2000					2001				
Rating	**year**	**year**	**Q1**	**Q2**	**Q3**	**Q4**	**year**	**Q1**	**Q2**	**Q3**	**Q4**
A or higher grades											
Issuance	8.3	10.2	1.0	2.1	3.7	3.4	20.8	5.1	3.7	6.3	5.6
Redemption	8.0	12.2	1.5	1.8	2.6	6.3	15.4	1.8	1.0	4.5	8.2
Net increase	0.3	–2.0	–0.5	0.3	1.1	–2.9	5.4	3.3	2.8	1.8	–2.6
BBB											
Issuance	9.8	4.6	0.7	1.5	1.6	0.8	9.0	2.9	1.6	3.2	1.4
Redemption	6.1	12.1	2.1	2.3	3.2	4.4	9.6	2.2	0.9	1.8	4.7
Net increase	3.7	–7.6	–1.4	–0.9	–1.6	–3.6	–0.6	0.7	0.7	1.3	–3.3
BB or lower											
Issuance	6.8	1.3	0.4	0.4	0.2	0.2	1.9	0.0	1.7	0.1	0.1
Redemption	10.5	8.2	1.9	2.0	2.3	2.1	5.9	2.0	1.3	1.2	1.4
Net increase	–3.7	–7.0	–1.4	–1.5	–2.1	–1.9	–4.0	–2.0	0.4	–1.1	–1.3
Total[2]											
Issuance	26.3	17.6	2.6	4.3	6.0	4.7	32.4	8.1	7.1	9.9	7.2
Redemption	30.4	33.4	5.8	6.3	8.3	13.0	31.5	6.2	3.3	7.5	14.5
Net increase	–4.1	–15.8	–3.3	–2.0	–2.3	–8.3	1.0	1.9	3.9	2.4	–7.3

[1] Public issuance and redemption only (excluding ABSs, workout and debt rescheduling corporations). [2] Including secured bonds.

The difficulties experienced by relatively small firms with lower credit ratings in rolling over their maturing obligations prompted a set of measures early in the second half of 2000. These measures included the introduction of primary collateralised bond obligations (P-CBOs) for the securitisation of

lower-rated corporate bonds and the establishment of a 10 trillion won "Bond Fund",[5] with subscriptions from 15 banks and other financial institutions, for the purchase of lower-rated corporate bonds from primary market or P-CBOs. In addition, two state-owned guarantee funds, the main one being Korea Credit Guarantee Fund (KCGF), undertook partial guarantees on senior tranches of P-CBOs as a means of enhancing their creditworthiness. By these expedients, the authorities attempted to increase the amount of bond financing going to relatively small firms with lower credit ratings. They were reasonably successful, and 7.3 trillion won of P-CBOs were issued in the last five months of 2000. About 40% of firms raising funds via P-CBOs were rated sub-investment grade.

Table 5

Issuance of primary CBOs

(in trillions of won)

	Amounts	of which	Underlying assets by grade				Credit guarantee ratio[1]
		senior tranche	A	BBB+ to BBB	BBB-	BB and lower	
2000	73.1	70.1	2.9	20.4	28.3	21.5	34%
2001	55.7	53.7	2.3	18.5	13.6	21.4	53%
Total	128.8	123.8	5.1	38.8	41.9	42.8	42%

[1] Ratio of credit guarantee to senior tranche.

Despite these measures, financing conditions in the corporate bond market continued to deteriorate. As the issuance of corporate bonds in the form of public offerings became increasingly weak, net redemptions increased from 5.2 trillion won in the first half of 2000 to 10.7 trillion won in the second half. Taking account of corporate bonds issued through P-CBOs, the corporate sector redeemed corporate bonds to the value of 3.4 trillion won during the second half of 2000. However, as some firms used P-CBOs to raise new funds instead of rolling over their maturing obligations, the BoK estimated[6] that the corporate sector was compelled to redeem 5.7 trillion won of maturing bonds during the second half of 2000.

As financing conditions in the corporate bond market, especially those for relatively large firms with lower credit ratings, worsened further in late 2000, some additional support measures for the bond market were implemented. A second 10 trillion won "Bond Fund " was established,[7] with similar goals to the first fund, with contributions from a smaller number of banks and in addition from postal savings and pension funds.

A further scheme, often called "the Korea Development Bank (KDB) prompt underwriting scheme", was announced at the end of December 2000 and was designed to remain in place for one year.[8] It

[5] Subscribers to the Bond Fund deposit their money with ITCs, which then establish dedicated funds. According to the investment guidelines set by subscribers, ITCs' purchases of P-CBOs may represent up to 50% of subscribed funds.

[6] The BoK conducted a survey of firms which had used P-CBOs for financing in early 2001. According to the survey, of a total of 7.3 trillion won, 5 trillion won was raised to roll over maturing bonds while 2.3 trillion won represented new financing.

[7] The purchase guidelines of the second tranche were changed to allow the direct purchase of P-CBOs by subscribers. This was because the risk weighting of subscribers' direct purchases can be reduced in line with the proportion of partial credit guarantees provided by the government-owned credit guarantee agencies, whereas beneficiary certificates of ITCs carry a risk weight of 100% for bank capital requirements.

[8] The scheme operated in the following way. If firms under consideration were judged to be viable by a committee consisting of the KDB, their creditor banks and the KCGF, they would be allowed to participate in the scheme if they repaid 20% of their maturing bonds and presented credible rehabilitation plans. The KDB would then act as underwriter for the rollover of the remaining 80% of maturing bonds at the average prevailing secondary market yield on similarly rated bonds plus 40 basis points. As the underwriter of 80% of the maturing bonds, the KDB would repackage and sell 70% of them, have the

provided funding for the rollover of maturing bonds issued by large firms that had temporary liquidity problems but good prospects of survival. As of end-2001, 2.6 trillion won of corporate bonds had been issued through this scheme.[9] Initially, six larger firms including four subsidiaries of Hyundai Group, were allowed to participate. However, the number of eligible firms was reduced to only one from September 2001, as one had achieved improved liquidity conditions and four had debt rescheduling programmes with their creditors.

These measures, together with a sharp decline of interest rates from the beginning of 2001, and market participants' optimism that the economy would soon recover and corporate cash flow conditions improve accordingly, led financing conditions in the corporate bond market to improve substantially during the first eight months of 2001. To a certain extent, this also reflected market participants' optimistic view that the economy would move into a recovery phase from the second half of the year and that cash flow conditions in the corporate sector in general would improve accordingly. During the first eight months of 2001, the monthly amount of new corporate bond issuance in the form of public offerings regularly began to exceed that of corporate bonds redeemed for the first time since July 1999. Table 4 above shows that, during this period, firms with credit ratings of A or above made net issuances while those of sub-investment grade made net redemptions.

It is puzzling why firms with higher credit ratings issued a huge amount of corporate bonds during this period, although their demand for long-term funds for capital investment was very weak, given the ongoing rapid downturn of the economic cycle. According to a BoK survey, almost half of net issuance of bonds was designed to raise funds to repay obligations falling due within the second half of the year, when the maturities of these firms' bonds were concentrated.

Since September 2001, however, overall redemptions of corporate bonds have begun to exceed new issuance again. To a certain extent, this reflects the fact that many firms with higher credit ratings are repaying their maturing bonds using funds they raised from their large-scale bond issuance. However, as can be seen from Table 4, the fact that redemption of bonds issued by firms with lower credit ratings has increased further implies that financing conditions in the corporate bond market have again deteriorated. This reflects not only market participants' expectations of a further delay in the recovery in economic growth but also greater uncertainty over the scale and duration of Korea's economic downturn after the terrorist attacks on the United States on 11 September.

3. Current state of the corporate bond market and causes of its problems

The primary market

The size of the corporate bond market in Korea is now by no means small; 134 trillion won of corporate bonds (including ABSs) were outstanding as of end-2000. Furthermore, in terms of the ratio of outstanding corporate bonds to GDP, the Korean corporate bond market is the largest in the world.

Given the relatively large scale of the corporate bond market, one of its important tasks is to facilitate the periodic rollover of a huge amount of corporate bonds. Before the currency crisis, the market could keep growing as long as financial institutions could afford to provide credit guarantees as the majority of corporate bonds issued carried such guarantees. Since financial institutions were not very cautious about providing credit guarantees for corporate bond issuance during that period, the corporate bond market was able to expand rapidly.

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main creditor banks absorb 20% and take the remaining 10% onto its own books. The corporate bonds underwritten by the KDB are sold through private placement rather than public offering.

[9] 1.6 trillion won had been issued in Q1, 0.3 trillion in Q2, 0.4 trillion in Q3 and 0.3 trillion in Q4.

Table 6

Corporate bond markets

	Korea[1]	United States	Japan	United Kingdom	Germany	France
(End-year)	(2000)	(1998)	(1998)	(1998)	(1998)	(1997)
Billions of US dollars	71 (106)	1,622	626	224	51	18
Ratio to GDP	17.3% (25.6%)	19.1%	16.5%	16.0%	2.4%	1.3%

[1] Figure in brackets includes ABSs.

Sources: Bank of Japan; Bank of Korea.

However, the structure of the corporate bond market changed dramatically after the crisis. With the subsequent predominance of non-guaranteed corporate bonds, financing conditions in the primary market have become increasingly vulnerable to changes in prevailing macroeconomic fundamentals which may affect the credit quality of the issuers, together with demand and supply conditions in the market such as the liquidity conditions of major investors and the size of the overhang of corporate bonds awaiting rollover.

The abnormal surges of funds into ITCs' beneficiary certificates made possible the absorption of the vast amount of non-guaranteed corporate bonds issued during the second half of 1998 and early 1999. By contrast, demand conditions, especially in the lower-grade segment, have not been favourable since mid-1999 following the correction of fund inflows into ITCs' beneficiary certificates after the collapse of Daewoo Group. In addition, investors have become increasingly sensitive to credit risk as the credit quality of the issuers in general has deteriorated sharply with the continuous rapid slowdown of economic growth since the third quarter of 2000. At the same time, the huge amount of corporate bonds issued right after the crisis generated a bunching of maturities which needed to be rolled over from the second half of 2000 until early 2002. The government's introduction of a method of securitisation using P-CBOs, involving the pooling of risky bonds in an attempt to narrow the wide preference gap between bond investors and issuers, together with other measures including the KDB prompt underwriting scheme, proved to be very effective in preventing the worst case scenario of the problems in the primary market for corporate bonds.

This, however, does not mean that all the problems in the primary market for corporate bonds have come to an end. As can be seen from Table 7, while the amount of maturing corporate bonds awaiting rollover will moderate slightly compared with 2001, it still remains high.

On the other hand, demand conditions in the primary market for non-guaranteed corporate bonds have deteriorated further. Investors have become highly sensitive to corporate credit risk in general, amid the ongoing severe economic downturn and growing concerns over its scale and duration after the events of 11 September. Consequently, the range of firms that are unable to raise funds through public offerings in the corporate bond market is becoming increasingly wider. For instance, it has become very difficult for BBB-rated firms to issue their bonds by public offering. This reflects:

- *A lack of progress in corporate sector restructuring*. Right after the crisis, the ITCs had large funds available for the purchase of corporate bonds, due to the surge of funds into their beneficiary certificates. This allowed a number of non-viable large firms to raise funds from the corporate bond markets, which permitted them to survive on the basis of a sudden apparent improvement in their liquidity conditions. However, as the surge in fund inflows to ITCs subsided and an overhang of corporate bonds awaited maturity, it became almost impossible for these firms to tap the corporate bond market. In addition, the fact that some firms commonly regarded by market participants as non-viable continued to survive often made the situation even worse.

Table 7

Redemption schedule of corporate bonds[1]

(in trillions of won)

	2001	2002				
	Year	Year	Q1	Q2	Q3	Q4
Total	45.9	32.2	10.8	8.6	6.2	6.5
Public offering;	31.5	18.6	7.4	5.6	3.3	2.3
(A or higher)	15.5	9.1	2.8	2.6	2.0	1.7
(BBB)	9.6	6.5	3.2	2.2	0.8	0.3
(BB or lower)*	6.4	3.0	1.4	0.8	0.5	0.3
Workout	14.4	4.2	1.1	0.4	1.0	1.6
P-CBO;	0	6.9	0.9	2.3	1.5	2.1
(BBB grade)	0	4.8	0.5	1.7	1.0	1.6
(BB or lower)*	0	2.1	0.3	0.6	0.5	0.6
KDB scheme*	0	2.6	1.4	0.3	0.4	0.5
Low-grade[2]	*6.4*	*7.7*	*3.1*	*1.7*	*1.4*	*1.4*

[1] Including primary CBOs and the KDB scheme. [2] Sum of those marked *.

- *Investor protection* remains very poor for non-guaranteed corporate bonds. Currently, there is no practice of inserting protective bond covenants to safeguard the interests of corporate bondholders against a deterioration of the issuer's ability to repay interest and principal, while, in contrast, the entry into covenants for bank loans is a common practice. The main reason is that the relatively short history of active issuance of non-guaranteed corporate bonds means that neither investors nor issuers are alert to the importance of writing specific bond covenants.
- *Low recovery ratio* of bonds in default. Although official figures are not available, anecdotal evidence from bonds issued by Daewoo suggested that the ratio is well below 30% of face value, much lower than the 50% norm in the United States. This reflects the frequent decline of the liquidation value of insolvent firms after the long and complicated process of their bankruptcy and winding-up, due mainly to the complexities of the associated legal arrangements. Specifically, where a company is in default and there is a move to have it wound up, the matter is governed by three laws,[10] each with a different philosophy and a different specification of the process. Thus, under the Korean system, it takes much more time and effort to collect debt holders' claims from troubled firms.
- *Credit ratings* provided by local credit rating agencies are not very reliable. As can be seen from Table 8 below, the historical default rates for A- and BBB-rated firms are higher than for BB-rated firms. This reflects a long tradition of window-dressing of the financial statements of firms, dubious audit practices, inadequate accumulation of historical data for the credit analysis of individual firms and frequent government intervention in support of ailing firms.

[10] Bankruptcy Law, Consolidation Law and Corporate Liquidation Law.

Table 8

Default rates by credit rating, 1991-2000

AAA	AA	A	BBB	BB	B
0.0%	2.3%	5.0%	5.2%	4.3%	11.2%

At the same time, notwithstanding their success so far, the recently introduced government measures to support the rollover of maturing corporate bonds including P-CBOs and the KDB scheme do not appear to be a sustainable way to handle the problems of the primary market for corporate bonds. Since the KDB scheme will be discontinued in 2002,[11] the only supportive measure associated with the government will be P-CBOs. However, the growing use of P-CBOs itself has the following problems:

- While a few issues of P-CBOs were voluntarily purchased by some financial institutions, the majority of P-CBOs were absorbed by either the Bond Fund or its subscribers as a part of meeting their mandated ratios for the purchase of P-CBOs.
- Since the credit enhancement scheme for P-CBOs relies solely on government-backed guarantees, the growing use of P-CBOs intrinsically involves the possibility of substantial contingent liabilities for the government if some portion of the underlying assets of P-CBOs go into default.
- Since almost all P-CBOs were issued with a credit rating of AAA and maturity of between one and a half and two years, it is difficult for their issuers to diversify the investor base.
- The growing use of P-CBOs gives rise to a moral hazard problem by weakening the incentives for originators to speed up their restructuring efforts. It could also result in a predominance of privately placed corporate bonds with lower credit ratings designed for P-CBOs matched by a shrinking share of issuance of lower-grade corporate bonds by public offering, a typical case of an adverse selection problem.

The secondary market

In the secondary market, the liquidity of corporate bonds remains very poor compared with government bonds. In addition, the trading volume of corporate bonds shrank sharply after the collapse of Daewoo Group and the liquidity problems of ITCs in July 1999. This is in stark contrast to the remarkable growth of the trading volume of government bonds (Table 9).

As can be seen from Table 10, the decline in the trading volume of lower-rated corporate bonds is quite notable. Bond transactions in the secondary bond markets have increasingly concentrated on sovereign bonds and corporate bonds with higher credit ratings.

Looking at the investor base of corporate bonds shown in Graph 4, financial institutions hold 60% of total corporate bonds outstanding, while the shares of contractual savings institutions such as life insurance companies and pension funds are relatively low compared with similar markets in advanced economies. A number of factors underlie their relative lack of interest. The maturities are not long enough for them to be suitable for assets and liabilities management by these institutions. Although the average maturity of corporate bonds has begun to lengthen after the active issuance of government bonds with maturities longer than five years, the majority of corporate bonds continue to be issued with maturities of three years or less. The institutions also have poor credit analysis skills and rigid investment guidelines.

[11] The KDB recently announced that it would no longer underwrite corporate bonds previously eligible for its prompt underwriting scheme.

Table 9

Transactions in the secondary market

	1997	1998	1999	2000	2001
Daily turnover (in trillions of won)					
Corporate bonds	0.4	1.3	1.5	0.9	0.9
Government bonds	0.0	0.2	2.3	2.0	3.3
Total	0.8	2.3	4.7	6.3	9.4
Turnover ratio					
Corporate bonds	1.5	3.7	3.6	2.1	1.7
Government bonds	0.6	1.6	11.3	8.6	11.7

Table 10

Corporate bonds:[1] monthly trading volume

(in trillions of won)

	2000	2001				
	Year	Year	Q1	Q2	Q3	Q4
Non-guaranteed corporate bonds	15.2	16.0	12.7	16.5	13.9	20.7
AA and higher	5.2	8.5	5.4	7.3	7.3	13.8
A	3.7	3.2	3.5	4.0	2.6	2.9
BBB	4.9	3.0	2.7	3.9	2.7	2.5
BB and lower	1.4	1.3	1.1	1.3	1.3	1.4
Total bonds	156.3	232.6	246.0	207.1	255.6	221.7

[1] Includes ABSs.

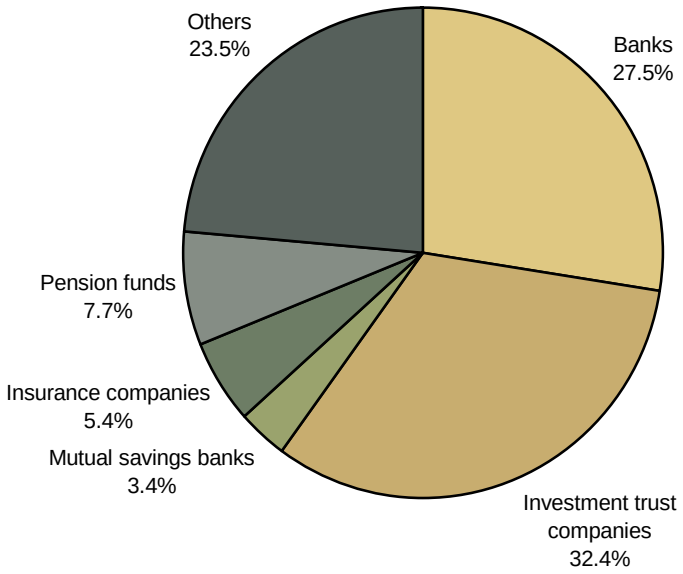
ITCs, whose share of corporate bond holdings is twice their share of government bonds, have become more active in transactions in the secondary market since the implementation of mark-to-market valuation of their assets. However, banks are not, in general, active traders in the secondary market since they usually buy and hold bonds until maturity.

While a combination of the increasing credit risk of the issuers and investors' greater attention to credit risk is fundamentally responsible for the low liquidity of corporate bonds, it also reflects the fact that market-making in the secondary market remains in its infancy. There is virtually no difference between the market-making role of dealers and brokers. In particular, securities houses, the major dealers in the bond market, do not take any bond positions onto their books; instead they simply match their clients' orders in a labour-intensive and less transparent brokerage process. Moreover, no dealers, including primary dealers in the government bond market, provide two-way quotations on bonds.

The absence of bid and ask price quotations makes the price discovery function of the secondary market inefficient. In addition, as the business of brokers and dealers is based on personal networks maintained through telephone contacts the market is less than transparent, with serious potential for

Graph 4

Investor base of corporate bonds



abuse and market manipulation. Moreover, the liquidity of the bond market in general could be highly vulnerable to prevailing market conditions. This is particularly the case for the corporate bond market, whose liquidity is much more vulnerable to prevailing market conditions than that of the government bond market. Because of this, most institutional investors prefer government bonds to corporate bonds, further removing liquidity from the corporate bond market.

4. Conclusions and policy implications

Since the crisis of 1997, there have been substantial structural changes in the corporate bond market in Korea. It has changed from one characterised by a predominance of corporate bonds carrying bank credit guarantees to one in which non-guaranteed bonds predominate. The issuance of ABSs has also become very popular and has contributed to the provision of a greater range of products and their heightened sophistication. In addition, investors have come to pay greater attention to credit risk of issuers, while issuers have become keener to enhance their credibility by disclosing more transparent financial statements to potential investors.

Notwithstanding these improvements, financial conditions in the corporate bond market have become increasingly vulnerable to changes in prevailing market conditions, including macroeconomic fundamentals and the demand and supply interplay of the corporate bond market. This fragility underlay the boom and bust cycle of the corporate bond market. In particular, the boom in corporate bond issuance during the second half of 1998 and early 1999, resulting from the huge surge in fund inflows to ITCs' beneficiary certificates, was followed by the bust of the corporate bond market after the bursting of the ITC deposit bubble from mid-1999. At the same time, participants in the market have paid far more attention to the credit risk of non-guaranteed corporate bonds, while a large proportion of non-guaranteed bonds issued during the earlier boom need to be rolled over at maturity. This dramatic shift in financing conditions of the market has prompted various measures by authorities.

Although the problems in the Korean corporate bond market are likely to persist in the foreseeable future, the many policy implications include:

- A sudden and large increase in the outstanding volume of corporate bonds above a certain sustainable level is more likely to impose a substantial burden on and pain for the economy in maintaining financial stability sometime in the near future. Moreover, the fact that the

abrupt and large increase in corporate bonds outstanding in Korea was accompanied by a dramatic shift of the market structure from a predominance of guaranteed bonds to that of non-guaranteed bonds made the situation even worse. Although the total outstanding volume of corporate bonds had shrunk back by the end of October 2001 to a level similar to that seen at the end of 1997, it is far from clear whether this level is any more sustainable than that of the pre-crisis period. The shift towards predominantly non-guaranteed bonds makes this assessment more difficult. In addition, the huge amounts of government bonds, government-guaranteed bonds and ABSs issued after the crisis could restrict the capacity of the economy to absorb this amount of corporate bonds.

- The prevailing credit quality of corporate bonds has important implications for maintaining the financial stability of the economy. Since the credit quality of corporate bonds is intrinsically volatile during a process of corporate sector restructuring, financing conditions in the corporate bond market in general are more likely to deteriorate sharply during such a period. However, a unique feature of the Korean experience is that there was a huge surge in the issuance of non-guaranteed corporate bonds during the process of corporate sector restructuring.

- In retrospect, these huge surges in fund inflows to ITCs' bond-type beneficiary certificates made it possible for various large firms including some non-viable "zombies", to raise funds by issuing non-guaranteed corporate bonds. This in turn allowed them to post sudden improvements in their liquidity conditions. This helped bring about a quick recovery of the economy in the aftermath of the currency crisis. However, as investors have become more concerned about credit risk of issuers after the bursting of the ITC deposit bubble and a large proportion of the corporate bonds then issued have matured, financing conditions in the market have deteriorated sharply, threatening the financial stability of the economy. In particular, a large proportion of the maturing corporate bonds to be rolled over were issued by firms with lower credit ratings, including these zombie firms, which exacerbates the situation even further.

  The fact that more "zombies" are operating and gaining access to the financial market poses two problems for the financial markets: one from the financial side and the other from the operational side. On the financial side, as more non-viable firms access financial resources, even more financial resources are needed to support them. As a result, more financial resources, which might otherwise be allocated to viable sectors, are diverted to potentially non-viable sectors, resulting in serious distortions in the efficient allocation of financial resources within the economy. In addition, the fact that some firms commonly regarded by market participants as non-viable continue to tap the financial markets makes the situation even worse and introduces additional question marks over the financial stability of the economy, since it becomes hard for market participants to distinguish viable from non-viable firms, creating more uncertainty in the financial markets.

  On the operational side, the existence of more non-viable zombie firms in the economy generates another channel of contagion to the economy and financial markets. If firms face liquidity problems, they tend to improve their short-term liquidity conditions for survival at the expense of their long-term profitability. For example, they often sell their products at bigger discounts to increase their market share and improve their liquidity conditions. Because of these unfair trading practices by non-viable firms, their otherwise viable major competitors may suffer from deteriorating profitability due to their narrowing profit margins. This, in turn, increases the credit risk in the corporate sector as a whole.

  From this, it is obvious that a necessary, though not a sufficient, condition for the early normalisation of the corporate bond market is the elimination of "zombies" from the economy. Therefore, one of most urgent tasks is to put more effort into speeding up the pace of corporate sector restructuring.

- Weaknesses in the institutional setup including poor accounting practices by financial institutions, a weak system of investor protection and an inefficient liquidation process have been shown to contribute substantially to turmoil in the corporate bond market and to amplify the magnitude of the disturbances. Specifically, to the extent that the maintenance of the principle of historical cost valuation accounting for ITCs, together with sharply declining interest rates, was mainly responsible for the massive inflow of funds into their beneficiary certificates and made possible the vast issuance of non-guaranteed corporate bonds in the

earlier stages, these poor accounting practices may have contributed to the turmoil in the corporate bond market and amplified its magnitude at later stages. In addition, the weakness of investor protection mechanisms caused by the absence of covenants to protect bondholders, as well as the possibility of sharp declines in the liquidation values of failed firms after the long and complicated bankruptcy proceedings, decreased investment in non-guaranteed bonds, especially lower-grade ones.

In view of this, greater efforts need to be exerted to establish a more appropriate institutional framework to support the development of the non-guaranteed corporate bond market. As the mark-to-market accounting principle has been in place since July 2000, the remaining tasks ahead include strengthening investor protection mechanisms for non-guaranteed corporate bonds. In this context, it is important to encourage the use of protective bond covenants, particularly in the case of issues with lower credit ratings, and to streamline insolvency proceedings by consolidating the three different laws governing corporate bankruptcy.

- When investors in the corporate bond market become highly risk-averse while the credit risk of bonds supplied is increasing, the securitisation of corporate bonds by pooling risky bonds proves to be very effective in bridging the wide gap in preferences between investors and issuers. In the Korean experience, the introduction of P-CBOs was very effective in avoiding the worst case scenario of the corporate bond market by lessening the burden of rolling over a huge amount of maturing corporate bonds issued by firms with low credit ratings.

  Notwithstanding these positive aspects of the securitisation of a pool of lower-rated corporate bonds issued by private placement, the current method of issuing P-CBOs also has negative aspects. These include the almost complete reliance on their purchase by the Bond Funds, the possible accumulation of substantial government contingent liabilities as a consequence of their exclusive use of credit guarantees provided by government agencies, the potential moral hazard problems of originators including the weakening of their incentives to implement self-rescue plans such as restructuring, and the increasing tendency of firms with inferior credit ratings to rely on P-CBOs instead of public offerings as a means to issue their corporate bonds.

  To reduce these negative aspects of the growing use of P-CBOs, it is important to allow market forces to play a larger role in the entire process of their issuance from the design to the final sale of the products. In this context, the following issues need to be addressed appropriately. First, in order to expand the investor base of P-CBOs, their maturities and credit ratings need to be broadened sufficiently to attract various investors with different risk appetites and investment horizons. This could be effective in attracting either many institutions lacking the capacity to create their own diversified portfolios or others with a poor ability to assess the credit risk of individual issuers. Second, to reduce government contingent liabilities caused by government agencies' provision of credit guarantees on P-CBOs and to discourage lower-rated firms from an increasing reliance on P-CBOs in raising funds, the fees need to be set on a commercial basis. Finally, to reduce the potential moral hazard problems of originators of P-CBOs, the practice of writing protective bond covenants should be mandated in the case of the underlying assets of P-CBOs and the observance of bond covenants by originators of P-CBOs needs to be tightly monitored by either designated trustees or special purpose companies.

- The development of the secondary market is very important in reducing the magnitude of the impact on the bond market of external shocks. The Korean experience was that the underdeveloped nature of market-making in the secondary market made the situation in the corporate bond market even worse. Therefore, efforts should be devoted to developing more efficient market-making and enhancing transparency in the secondary market.

- The financial market instability caused by turmoil in the corporate bond market may pose a challenge for the central bank in balancing its goals of maintaining price stability and ensuring stability in financial markets, and may severely limit the scope for monetary policy implementation in pursuit of its ultimate goal, achieving price stability. The turmoil in the corporate bond market placed a substantial burden on the BoK's implementation of monetary policy. This experience leaves it an open question to what extent the central bank can juggle its goals of maintaining price stability and financial market stability in the face of turmoil in the financial markets.

The development of debt markets in Malaysia

Dato' Salleh Harun

1. Introduction

The capital market in Malaysia has developed significantly in terms of market size, range of instruments and efficiency. This progress has enhanced its role in supporting economic growth and transformation. In particular, these developments were geared towards nurturing the capital market to fill the institutional gap in the financial system and complement the role of traditional lenders.

The Capital Market Master Plan launched in February 2001 provides the framework for the development of the Malaysian capital market in the new decade. Efforts will be directed at increasing the competitiveness of the capital market and at providing an effective mechanism for the mobilisation of funds to meet the growing needs of the economy.

The government also launched the Financial Sector Master Plan, which outlines the strategies for the development of the financial sector, in March 2001. The master plan resolves key issues in a holistic manner and recommends a model structure specifically for the banking sector, taking into consideration the existing domestic environment, regulatory and supervisory framework and infrastructure. From a broader perspective, the master plan provides a clear and common vision for the industry and strategies to be pursued over the short, medium and long term to achieve this vision.

In general, the development of the capital market in Malaysia has been facilitated by a strong infrastructure and a comprehensive legal, regulatory and administrative framework. Underlying its development are the basic prerequisites of political stability and sound macroeconomic policies which create a favourable environment for economic growth with price stability. Equally important have been the high saving rate and large domestic investor base.

2. The government debt

Malaysian government securities (MGS) are interest bearing bonds issued by the government through Bank Negara Malaysia (BNM), the central bank, to raise long-term funds from the domestic capital market to finance the government's development expenditure. MGS are issued by tender via appointed principal dealers. Tendering is done through the Fully Automated System for Tendering, whereby the coupon rate is determined by the weighted average of the successful bids.

In the early years, MGS were issued to meet the investment needs of the Employees' Provident Fund, banks and insurance companies. In the late 1970s and early 1980s, MGS were used to finance public sector development expenditure. From 1989 to 1992, they served to fund part of the government's budget deficit, and in the mid-1990s, to prepay some of the expensive government external loans.

In the 10-year period from 1988 to 1997, new MGS issues slowed, due to the reduction in the government's borrowing programme. The government was scaling back its operations to enhance the private sector's role as the main engine of growth.

One of the noticeable features of the MGS market is the creation of a captive market as the papers are sought to meet mandatory investment requirements for most financial intermediaries, insurance companies and provident and pension funds. Furthermore, MGS are risk-free papers and hence generally held to maturity. Trading is very thin and only picked up from late 1999 onwards.

Recognising the importance of an active and viable secondary market for MGS, several regulatory and operational reforms were introduced to the market. The reforms also met other objectives such as facilitating the conduct of monetary policy, adding greater depth to the market, providing flexibility in the government's management of debt and increasing allocative efficiency.

MGS remained the most actively traded bonds, accounting for MYR 15 billion of the total monthly trading volume of MYR 38 billion in 2001.

3. The private bond market

The development of the private debt securities (PDS) market aimed to meet the financing needs of the expanding Malaysian economy, particularly the funding requirements of privatised infrastructure projects. It aimed to provide an alternative to bank borrowings and complement the more mature and sophisticated market in MGS and equities.

The bond market has been a significant source of finance for various development projects in Malaysia. Though Malaysian government bonds dominate the bond market, constituting about 48% of outstanding issues at end-2000, PDS outstanding grew by nearly 380 times from MYR 0.4 billion as at end-1987 to MYR 152 billion at end-September 2001. The market for PDS is now equivalent to 28% of GDP. This is in line with the government's aspiration to promote the private sector as the engine of growth.

The range of debt securities has also widened in tandem with the growth of the market. In general, the PDS market comprises various types of instruments with the range covering fixed rate, floating rate, zero-coupon, convertible/non-convertible and secured/unsecured. The maturity ranges from three to 20 years.

The bulk of the PDS are offered to investors on a bought deal basis. All tradable PDS must be rated to ensure confidence and assist in the investment decision-making process. The issuers of these PDS comprise private and public companies.

The PDS market also includes issues that are based on Islamic principles, which accounted for 25% of the market at end-September 2001. The most common principle used is the Al-Bai Bithaman Ajil concept, involving the financing of an asset on a deferred payment basis. Other various concepts applied are Musyarakah, Ijarah, Mudharabah and Qardhul Hasan. The issuance of Islamic PDS can be attributed to a higher demand for the instruments by Islamic banking units and Islamic unit trust funds.

4. Market infrastructure

To improve the efficiency of the tendering for securities, BNM introduced the *Fully Automated System for Issuing/Tendering* (FAST**)** to replace the tender form submission. FAST is an automated tendering system whereby the invitations to tender, the submission of bids and the processing of tenders for scripless securities and short-term private debt securities are conducted electronically. The process reduces errors and delays arising from manual handling of tenders. Under this system, BNM acts as the facility agent for both the government and its own issues. For PDS, the companies appoint financial institutions as their arrangers and facility agents. FAST has now been enhanced to be the system to capture all primary issuance of all unlisted instruments.

The *Bond Information and Dissemination System* (BIDS) is a computerised and centralised database on Malaysian ringgit debt securities, providing information on the terms of issue, real-time prices, details of trades done and relevant news on the various government and private debt securities.

The information provided by BIDS facilitates both primary and secondary market activities in the domestic bond market. Financial institutions are obliged to report details of trades done, including price and volume. Rating agencies, on the other hand, are required to update the issuer's ratings in the BIDS corporate homepage. The information is also disseminated via selected information providers such as Bloomberg and Reuters to achieve wider coverage. BIDS is equipped with a surveillance system to monitor the activities of the debt securities listed there.

In July 1999, the deferred net settlement protocol was replaced with the *Real-Time and Gross Settlement System* **(**RENTAS) to enhance liquidity and reduce settlement risks. Online RENTAS reduces settlement risks for market participants as it introduced a delivery versus payment (DvP) arrangement for transactions involving securities. Under DvP, securities transactions will only be

effected when securities and funds are available in both the seller's and the buyer's accounts. Currently, the system captures all government and BNM issues and unlisted issues of corporate bonds, which account for approximately 95% of the total market.

To ensure the smooth functioning of both the primary and the secondary market, BNM has issued several codes of conduct and rules. These include the Malaysian Code of Conduct for Principals and Brokers in the Wholesale Money and Foreign Exchange Markets (MCC), rules on FAST, BIDS and RENTAS. As BNM operates the systems and the major players in the market are licensed financial institutions under the purview of BNM, the codes and rules are enforced by the central bank. For example, under the MCC, BNM has the power to investigate any breach of the MCC.

5. Major measures undertaken to develop the capital market

As part of continuing efforts to promote an active secondary market as well as to promote a more dynamic and performance-based dealer system, several measures have been introduced:

System of Principal Dealers

A system of Principal Dealers (PD) was introduced in 1989. They are appointed by BNM to bid for primary issues of specified securities, and trade and make markets for these securities. These securities include MGS, T-bills, BNM bills, Khazanah bonds and Cagamas debt securities.

Since its introduction, the PD system has undergone several reviews aimed at developing more dynamic and performance-oriented market-makers. Their roles have expanded from merely compulsory bidding in the primary issues and providing two-way price quotations to participating in the money market auctions, continuously quoting for selected benchmark securities and maintaining a minimum trading volume for selected papers. Along with the obligations the PD had been given privileges such as accepting repos of less than one month from non-interbank customers and holdings of these papers are exempted from the statutory reserve requirement. PD have also been entrusted with improving the secondary trading of the market, especially the government securities market, to build the benchmark yield curve.

In February 2002, BNM reviewed the incentives extended to the PD. The privilege of accepting repos of less than one month from non-interbank customers was removed but the PD were granted the privilege of participating as both borrower and lender in the newly launched Securities Borrowing and Lending Programme under RENTAS and allowed to participate in the repo/reverse transaction for the purpose of hedging committed treasury activities.

Credit rating system

As part of BNM's continuing effort to develop the PDS market, Rating Agency Malaysia Berhad (RAM) was incorporated in November 1990. RAM is the first credit rating agency in the ASEAN region. The most important functions of RAM are to rate all PDS and to disseminate timely information to potential investors in both the primary and the secondary markets. A second rating agency, Malaysian Rating Agency Corporation Berhad, was established in September 1996.

Establishment of the National Bond Market Committee (NBMC)

The NBMC was established in June 1999 to provide the overall policy direction and rationalise the regulatory framework for the orderly development of the market. It is chaired by the Secretary-General of Treasury from the Ministry of Finance and consists of representatives from BNM, Securities Commission, Economic Planning Unit, Registrar of Companies and Kuala Lumpur Stock Exchange. It has established three working groups, namely the Legal and Regulatory Reform Committee, the Product and Institutional Development Committee and the Infrastructure and Operation Work Group.

Development of an MGS benchmark yield curve

The prerequisite for the development of any bond market is the existence of a benchmark. A significant, liquid, efficient and market-oriented government securities market would contribute to more efficient sovereign debt management, effective monetary operations and financial stability. For the market participants, a benchmark is necessary to price issues against the benchmark. It would also facilitate the intermediation process through efficient market pricing and borrowing and lending decisions in the primary and secondary markets.

In March 2000, the government via the NBMC acknowledged that MGS has a role to play in the development of such a benchmark. Since then, BNM has published the auction calendar for the issuance of MGS on an annual basis. This improves the transparency of the issuance and assists the market players.

To facilitate the creation of the benchmark yield curve, other measures were taken in parallel, such as reopening of the off-the-run MGS issues, implementation of transparent and highly active two-way prices for the benchmark securities via the Benchmark Screen under the BIDS system and closer monitoring of the market activities and PD performance.

6. Issues and challenges

Over the last decade, the Malaysian capital market has undergone tremendous change and development and assumed a significant role in the overall financial sector. Substantial efforts have also been made to foster the development of the market and its continued growth. On this note, there are several issues and challenges in developing the Malaysian market further. These include having a true benchmark yield curve, a more liquid market, widening the issuer and investor base, and having risk management instruments.

The role of the central bank in developing debt markets in Mexico

José Julian Sidaoui[1]

1. Introduction

Debt markets play an important role in any economy as they provide economic agents with alternative options to banking for allocating their savings efficiently. From a central bank perspective the development of domestic debt markets is of particular relevance, as they enable the use of short-term interest rates to convey monetary policy signals across the whole maturity spectrum.

In Mexico, the central bank has participated actively in developing domestic debt markets. Banco de México (BM) has not limited its contribution to attaining low and stable rates of inflation, a necessary condition for developing sound debt markets. It has also taken other key measures such as the use of government securities as monetary policy instruments, the development of quick and reliable clearing and settlement systems, the modification of the legal and regulatory framework and the promotion of market transparency. It has collaborated with the Ministry of Finance in the design of government bonds, the composition of domestic debt and issuance and placement of it.

This document analyses significant central bank policy decisions that have contributed to the development of debt markets in Mexico. It is organised as follows. After this introduction, the second section describes the evolution of debt markets in Mexico; the third deals with the role of BM in developing debt markets; and the last lists some ideas for future developments.

2. The evolution of debt markets in Mexico

Mexican authorities have made considerable efforts in the last two decades to develop domestic debt markets. The initial step was taken back in 1978, when the first government peso-denominated fixed rate security (Cetes) was issued. At the beginning, both the number of market transactions and the amounts involved were small; securities had short-term maturities, there was no secondary market and the government determined interest rates. Despite these limitations, over the years, both the government and the central bank increasingly relied on the debt market, the former to cover its financial needs and the latter as an instrument of monetary policy.

Secondary markets started to develop slowly after 1982, when the government allowed banks and brokerage houses to submit bids at public auctions for Cetes. During that period, BM decided to begin gradually conducting its monetary policy through the use of marketable government securities. To support the development of markets for government securities, BM refrained from issuing its own securities until 2000. To subtract liquidity from or add it to money markets, BM sold and purchased government securities.

Government debt markets

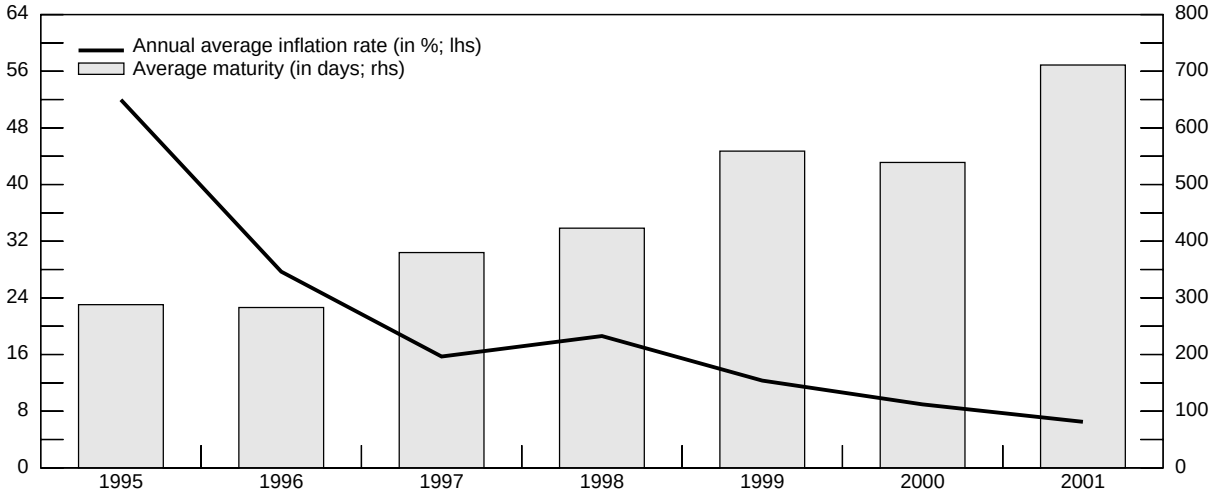
In the early stages of debt market development, when private issuance is small, financial authorities usually pay particular attention to improving the market for government securities as these provide a benchmark for pricing other fixed income securities, help financial intermediaries to manage their interest rate risks and can also be used as vehicles for funding.

[1] The views expressed in this paper are the author's and do not necessarily represent those of Banco de México.

The characteristics of government debt and its issuance process have a profound influence on the development of markets. An active and liquid market requires securities with certain characteristics to facilitate pricing and trading. Securities should have simple structures with codes that identify them by the date of their maturity rather than by the date of their issuance. Measures to facilitate trading such as easy access to market information are also essential to eliminate information asymmetries.

The composition and average maturity of peso-denominated government securities have been changing over the years in response to several episodes of financial instability. Policymakers have been constrained in the issuance of marketable securities by the changing risk perceptions of market participants in response to the sharp depreciations of the domestic currency and their ensuing impact on inflation and interest rates.

Graph 1
Average maturity of government domestic debt



Source: Banco de México.

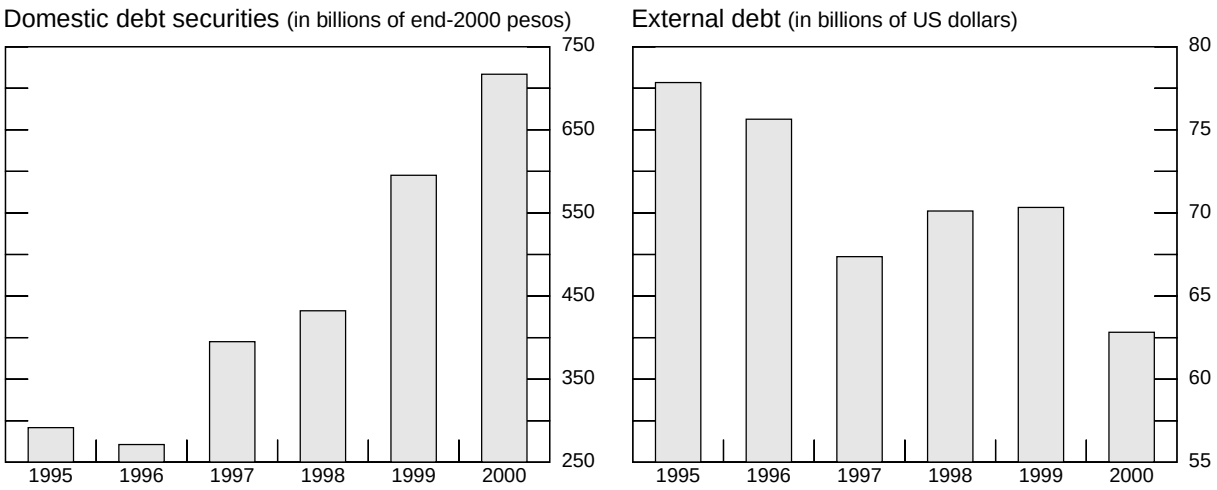
For many years, the government's domestic funding came from placing short-term zero coupon bills, floating rate notes, inflation- and oil-price-indexed bonds, and, until 1994, short-term dollar-linked bonds. The first issuance in the market of one-year zero coupon bonds took place in 1990. Other sources of funding were obtained from the issuance of long-term bonds sold to banks over-the-counter to facilitate their compliance with mandatory reserve requirements.

In several episodes of stress, the government was able to issue only short-term bills, sometimes with maturities as short as seven days. On more recent occasions, such as the Asian and Russian crises of 1997-98, the government had to increase its reliance on floating rate bonds, as investors were reluctant to be exposed to interest rate risks. The strict observance of monetary and fiscal discipline has allowed the Mexican economy to enjoy economic growth and financial stability in the last few years. This stability has permitted the government to increase the size and average maturity of its domestic debt (Graph 1) and decrease its dependence on foreign debt. In fact, in recent years, the stock of peso-denominated government debt has been growing rapidly, as the government has issued securities in the domestic market beyond the amount required by its fiscal deficit, thus reducing the stock of foreign debt (Graph 2).

As macroeconomic conditions have become more stable, market participants are showing greater willingness to hold longer maturities and fixed coupon securities, to take advantage of the expected decline in interest rates. The government has therefore been able to issue successfully three-, five- and 10-year fixed coupon bonds and to decrease the share of floating rate issues in the outstanding stock of government debt.

Graph 2

Federal government debt outstanding[1]



[1] Figures exclude securities sold by Banco de México for monetary policy purposes.

Nowadays, the government issues short-term zero coupon bills with maturities up to one year, floating rate bonds, fixed coupon bonds and inflation-indexed bonds with maturities up to 10 years (Table 1). Floating rate bonds constitute half of the government debt. Ten-year inflation-indexed bonds were issued for the first time in October 1999, five-year fixed coupon bonds were issued in May 2000 and 10-year fixed coupon bonds in July 2001.

Table 1

Government debt securities

Instrument	Type of coupon	Maturity	Coupon payment	Government debt outstanding (in billions of dollars)[1]		
				1999	2000	2001
Cetes	Zero	28, 91, 182 and 364 days		14.2	19.0	21.9
Bondes	Floating	3 and 5 years	28, 91 and 182 days	35.3	43.3	37.8
Udibonos[2]	Fixed	5 and 10 years	182 days	8.2	8.9	9.9
Bonos	Fixed	3, 5 and 10 years	182 days		3.5	12.0
Total				**57.8**	**74.7**	**81.6**
% to GDP				12.0%	13.2%	13.1%

[1] Includes securities sold by BM for monetary policy purposes. [2] Inflation-indexed bonds.

The central bank started issuing its own securities in 2000, to sterilise the continuous increase in its foreign reserves. These securities, called “Brems”, consist of one- and three-year floating rate bonds with coupons linked to overnight rates. BM considered this a more appropriate course than continuing to sell long-term government debt, as the latter has a larger impact on the shape of the yield curve. At the same time, the deposit insurance agency (IPAB) has been issuing floating rate debt with government guarantees to finance its operations and the costs incurred during the banking crisis of 1994-95. These measures have augmented the variety of low credit risk securities available to investors.

Primary market

BM, acting as the government's financial agent, carries out auctions of government securities every week. In order to reduce the uncertainty in the process of securities issuance, the government commits itself to a preannounced quarterly calendar that provides the basic elements of its domestic debt strategy. This calendar specifies: the type of securities to be auctioned, the minimum amount tendered and the maximum nominal value of the total placement during the quarter.

Even though the government provides the issuance calendar in advance, the exact nominal amount and other technical characteristics of the instrument to be tendered are normally announced two working days prior to the auction. Securities are identified by their maturity date and certain issues are reopened to promote liquidity in the secondary market.

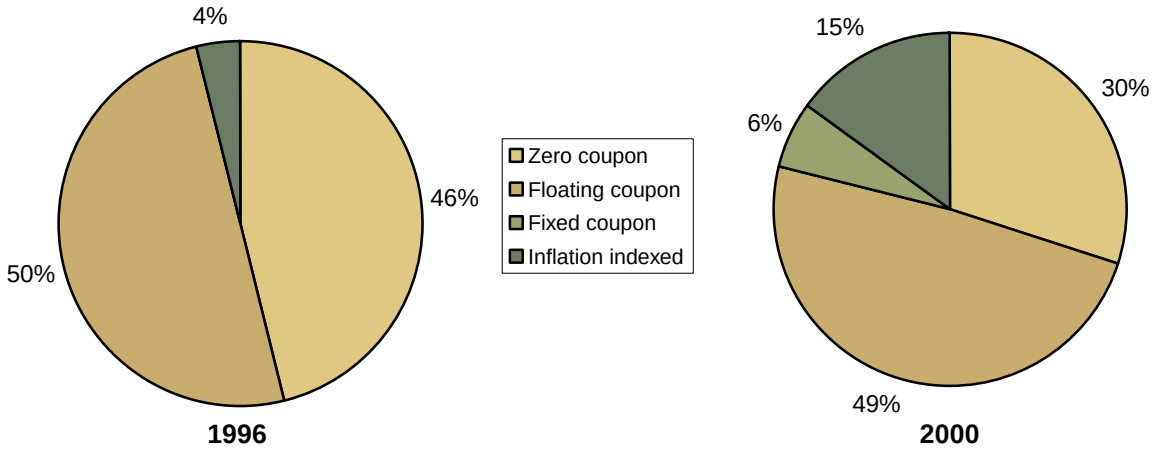
Primary auctions of government securities take place usually on Tuesdays, and are carried out through an electronic system developed by the central bank. Bids are received until 1.30 pm and the results are published at 3 pm. Banks, brokerage houses, pension funds, mutual funds and insurance companies are allowed to submit bids. Currently, all securities are placed following a multiple price auction procedure with the exception of fixed coupon bonds, which are placed using a Dutch auction mechanism. Settlement takes place 48 hours after the auction. At the same time, the government makes coupon and principal payments on outstanding securities.

The authorities must strike a difficult balance between issuing different maturities to provide the market with a benchmark yield curve and issuing amounts of single maturities large enough to attract investors concerned with liquidity. In this regard, a policy of reopening some issues several times has been adopted to increase the amount outstanding of particular securities but, at the same time, the government has avoided concentrating the maturity of large issues on a single date to decrease refinancing risks; see Sidaoui (2000).

Despite the efforts to extend the yield curve by issuing securities with maturities of up to five and 10 years, the average duration of the debt is relatively short and has increased proportionally less than the increase in average maturity, because a large proportion of longer-term bonds are floating rate notes.

Graph 3

Government domestic debt, by instrument



Note: Figures exclude securities sold by Banco de México for monetary policy purposes.

Source: Banco de México.

Secondary market

Securities in Mexico are dematerialised and registered at a private depository institution (Indeval). Most of the secondary market transactions with government securities are carried out through repo operations. Although the repo market is very liquid, there are hardly any operations maturing beyond seven days. Overnight repos represent the most liquid segment of the market, with an average daily volume close to $6 billion. Banks and brokerage houses use repos as the main source of funding for

their positions in government securities. They are the most important players and holders of government securities in the fixed income market. However, in recent years, institutional investors, particularly pension funds, have been gradually growing in importance.

The government's commitment to finance itself through the market even during periods of stress has been essential to developing a secondary market. In this regard the Mexican government has seldom made use of its right to reject bids at the primary auction. The last times bid results were rejected were in early 1995 during the Mexican crisis and in September 1998 at the peak of the Russian crisis.

Secondary trading of government securities is almost exclusively conducted in over-the-counter markets. Liquidity in the secondary market increased substantially when foreign investors were allowed to purchase peso-denominated government securities at the end of the 1980s. However, the participation of foreign investors in Mexico's peso-denominated markets has been continuously decreasing from its record 48% of the outstanding stock of government securities reached in 1994. Foreign participants have found it more convenient to hold long positions in peso interest rates through the use of foreign exchange forward contracts instead of direct investment in government securities.

Liquidity in secondary markets also improved with the participation of voice and electronic inter-dealer brokers in 1994-95, which facilitated price discovery. Around 90% of outright operations in the secondary market are now executed through brokers. Finally, the opening of the financial system to foreign banks at the end of 1993 and their increasing participation in the secondary debt market further improved liquidity. Foreign banks, especially smaller ones, derive their revenue from actively trading securities rather than from holding them, so their participation increased securities turnover substantially.

Liquidity in other securities is relatively small and it is highly concentrated in specific maturities. While zero coupon bills (Cetes) and fixed coupon bonds (Bonos) have the highest turnover, inflation-indexed securities (Udibonos) hardly trade (Table 2). This behaviour is related to the fact that inflation-indexed securities are usually held until maturity by participants such as pension funds, which seek to hedge their balance sheet's liability side. On the other hand, floating rate coupon bonds (Bondes) are purchased by brokerage houses, which finance their positions through the use of relatively short-term repos, and thus have more liquidity than Udibonos.

Table 2

Secondary market in government securities

(average daily turnover in millions of dollars)

	2000 Q1	2000 Q2	2000 Q3	2000 Q4	2001 Q1	2001 Q2	2001 Q3
Cetes	1,272	1,493	762	680	1,299	503	591
Bondes	163	51	67	70	53	80	121
Udibonos[1]	13	6	4	3	6	7	5
Bonos	51	155	204	864	945	906	1,062

[1] Inflation-indexed bonds.

Source: Banco de México.

The volume of operations differs significantly between Cetes and Bondes and between short-term and long-term maturities. The market activity in Cetes is concentrated on 90-day maturities. On the other hand, the most liquid Bonos are those maturing in 2003 despite their relatively short duration. The liquidity behaviour indicates that secondary market participants are reluctant to trade along the fixed rate yield curve, even though volume has increased.

Linkages of government securities

The development of government securities markets generates important positive externalities for the development of securities markets in general as it provides a benchmark for pricing private securities

and facilitates the introduction of new financial products for risk management. Non-government debt markets in Mexico are small, short-term in nature and comprise commercial paper, development banks' bonds, financial institutions' medium-term notes and corporate medium- and long-term bonds.

In the last two years, corporations have increased the amount of medium/long-term issues. However, most of the bonds issued are floating rate and inflation-indexed bonds. Fixed rate bonds represented only 25% of total issuance during the same period. A large proportion of bonds issued is rated AA or higher[2] as access to the domestic bond market is restricted to the most creditworthy Mexican firms such as large exporters and conglomerates. Large corporations have found it more convenient to tap the international markets for funds.

The investor base for marketable securities

Financial markets in Mexico, as in the majority of Latin American countries, are still dominated by banks, despite their decline in importance over the last few years. However, to ensure high liquidity and a stable demand for fixed income securities, it is crucial to have a diversified investor base in terms of time horizons, risk preferences, and trading motives.

Table 3

Major holders of government domestic debt securities

(billions of dollars)

	Cetes		Bonos		Bondes		Udibonos	
	2000	**2001**	**2000**	**2001**	**2000**	**2001**	**2000**	**2001**
Banks and brokerage houses	8.5	9.1	1.3	5.9	25.2	17.1	2.0	3.7
Mutual funds	3.0	3.7	0	0	3.8	3.0	0	0
Pension funds	0.7	0.9	1.2	3.4	9.6	14.8	2.5	2.4
Insurance companies	0.4	0.9	0.1	0.1	0.8	0.4	2.6	2.6
Foreign banks	1.2	0.5	0.2	0.8	0.6	0	0	0
Other	5.1	6.9	0.7	1.8	3.4	2.5	1.9	1.2
Total	19.0	21.9	3.5	12.0	43.3	37.8	8.9	9.9

Note: Figures include securities sold by BM for monetary policy purposes.

In the last few years, Mexican institutional investors such as pension and mutual funds, as well as insurance companies, have increased their participation in debt markets, helping to create a more stable demand for fixed income securities (Graph 4). However, the institutional investor base in Mexico remains underdeveloped. Funds held by private institutional investors (insurance companies, privately administered mandatory pension funds, voluntary occupational pension plans, and mutual funds) are estimated at the equivalent of about 10-11% of GDP. This represents about $60 billion, smaller than most of the larger countries in Latin America and not substantially above countries such as Argentina, Chile and Peru with substantially smaller populations.

[2] BBVA-Bancomer (2001).

Graph 4

Government domestic debt, by type of investor

Note: Figures include securities sold by BM for monetary policy purposes.

Source: Ministry of Finance.

3. The role of the central bank in developing debt markets

Over the years, BM has made different and important contributions to the development of efficient debt markets. A major contribution has been conducting its monetary policy through open market operations with government securities. However, some others have extended beyond monetary policy, and are related to the different mandates the law accords BM, such as financial agent for the government, guarantor of payment systems and promoter of financial stability. In this section the most important measures adopted by BM to improve the development of debt markets are discussed: its monetary policy instruments; its effectiveness as fiscal agent of the government; the legal and regulatory framework; the transparency of markets; and the development of derivatives markets in Mexico.

Monetary policy and the development of the government debt market

Since the early 1980s, the central bank took different measures to move gradually away from fixing interest rates and banks' reserve requirements to the implementation of monetary policy through open market operations. In this respect, banks' interest rates were liberalised (1987) and high reserve requirements for commercial banks were substituted by a liquidity coefficient (1989) which later on was suppressed (1991). Notwithstanding, the most important changes came after the float of the peso at the end of 1994. Under a flexible exchange rate regime, BM had to look for new intermediate objectives to anchor and conduct its monetary policy. At that time, in an environment characterised by high volatility in exchange and interest rates, it was considered technically impossible to set official rates.[3] Thus, Mexico's central bank decided to set quantitative targets consistent with its inflation objective.

Central banks exert an enormous influence over short-term interest rates by shaping the characteristics of key interbank settlement systems and determining the conditions that equilibrate supply and demand for bank deposits at the central bank.[4] Hence, BM decided to introduce a policy framework known as "zero average reserve requirement" to influence short-term rates without sending signals about any specific level.

[3] Marcos (1999).

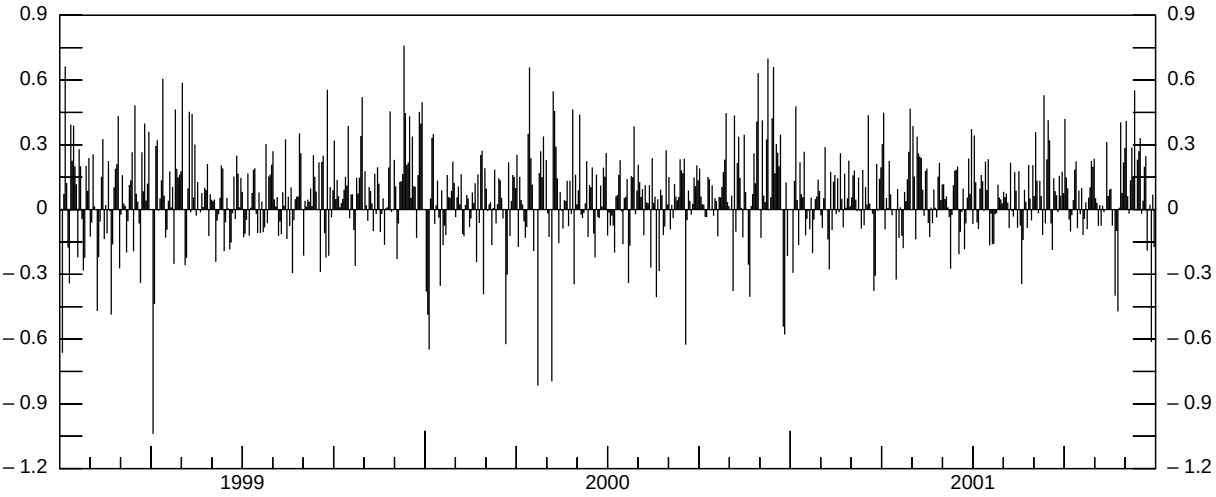
[4] Borio (1997).

Central banks' liquidity management represents a key element not only for the process of monetary policy implementation, but also for the development of efficient money markets. In this regard, BM has been making continuous efforts over the years to improve its ability to provide the appropriate amount of liquidity to banks so that each day the demand for the monetary base is satisfied at market-determined interest rates. The success of this policy has allowed interest rates to be dissociated from the liquidity level in the money market and hence reflect fundamental factors, such as current and expected changes in monetary conditions. The most important policies include: an active participation in the money market to add and subtract liquidity on a daily basis; the implementation of an end-of-day market for funds settlement;[5] and policies to eliminate two of the three "autonomous" sources of liquidity.

Autonomous sources of liquidity are movements in the monetary base caused by operations outside the direct control of the central bank. The three main autonomous operations that can generate liquidity are: purchases and sales of foreign currency by the central bank to maintain a fixed or pegged exchange rate regime;[6] movements in the Treasury's account at the central bank; and commercial banks' demand for notes and coin from the central bank to satisfy the public demand for currency.[7]

Graph 5
Liquidity forecasting errors[1]

In percentages



[1] Daily liquidity forecasting error/monetary base.

In Mexico, the first two sources of autonomous liquidity have been eliminated with the adoption by the authorities of a free floating foreign exchange rate regime and by requiring the Mexican Treasury to give BM 24-hour prior notice of any movement in its account at the central bank. BM has only to estimate the expected change in the public's demand for notes and coin. As part of its liquidity management policy, the central bank compensates every day for the expected changes in base money through open market operations. The forecast errors from estimating the demand for notes and

[5] The end-of-day market for funds settlement permits transfers of funds between the banks' current accounts at the central bank once the different payment systems (cheques, large-value payments, securities) have been cleared. In addition, in this market the central bank can conduct an extra round of open market operations in case there is an important error in forecasting the monetary base demand. This facility is very useful since, by the time it opens, both the market participants and BM have perfect knowledge of their liquidity position, and so they have the opportunity to square off such positions.

[6] Very often, foreign exchange regimes are outside the control of the central bank. In Mexico, the Exchange Commission, in which the Ministry of Finance has the upper hand, determines the foreign exchange regime.

[7] O'Dogherty (1997).

coin on a daily basis are relatively small and follow a random pattern (Graph 5).[8] The zero reserve requirement mechanism also has the advantage of removing banks' incentive to maintain reserves, thus facilitating the central bank's control over liquidity.

Government's financial agent

In recent years, the Mexican government and BM, as its financial agent, have made significant changes to the government issuance process. One notable change is the opening of primary auctions of government securities to more participants such as mutual and pension funds and insurance companies. It is also worth mentioning the reduction in the time span between the auctioning process and the announcement of results to just 90 minutes. The launch of an electronic system to conduct the primary auctions made the bidding process more efficient and enabled the central bank to process and publish the auction's results faster.

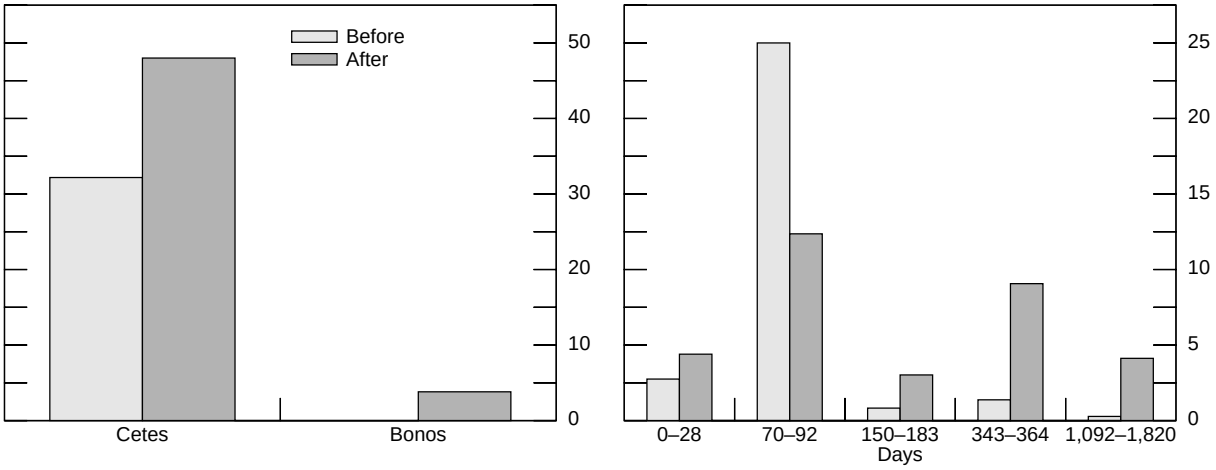
To give more certainty to market participants, the government announces its issuance programme on a quarterly basis. This announcement lists the securities to be auctioned each week, during the next quarter, and the minimum amount tendered by each type of security.[9] Primary auctions take place on a weekly basis, and the settlement and clearing two working days after.

With a view to increasing liquidity, the government introduced in 2000 the figure of "primary dealer or market-maker". The objective of "market-makers" is to enhance the liquidity of fixed rate securities in secondary markets by making continuous bid-ask offers in exchange for certain privileges, such as bidding for additional securities at the auction's average price results once they are known. Liquidity in short-term zero coupon bills (Cetes) and fixed-coupon bonds (Bonos) consequently increased substantially after 2000.

Graph 6

Government domestic debt turnover and the introduction of market-makers

Weekly turnover in billions of pesos



Source: Ministry of Finance.

[8] Alfaro (1997) provides a detailed description of methodologies for forecasting changes in the public's demand for notes and coin.

[9] The exact amount to be offered in each auction is announced on the last working day prior to the week of the auction.

Legal and regulatory framework

BM has been continuously modifying its regulations according to market developments and needs. At the same time, the central bank has actively participated in working groups aimed at changing legal frameworks and adopting new ones. One of the main changes was the authorisation in 1990 of commercial and development banks to negotiate securities in secondary markets without the intermediation of a brokerage house. Previously, banks were required to operate in secondary markets through brokerage houses as it was considered that intermediaries should specialise in different market activities.

The characteristics of systems and mechanisms used to clear and settle securities transactions constitute basic elements for the development of debt markets, as they play a crucial role in the distribution of the risks borne by market participants. In Mexico, as in many other countries, the central bank is responsible for the functioning of the payment system. During the last eight years BM has been working to comply with international standards and the industry's best practices.[10] Among the changes promoted, it is worth mentioning the electronic linkage between banks' accounts at BM and the National Depository Institute (Indeval) to allow the settlement of securities transactions under delivery versus payment (DvP). To facilitate securities settlement with DvP, BM issued regulations for securities lending in 1994. Recent amendments to the securities markets law introduced the central counterpart for the future settlement of securities using a clearing house. Currently, BM is working on a new law that will address payment finality among other issues.

As mentioned above, most of the secondary market transactions in government securities are carried out through repo operations. However, recent reforms approved by Congress limited the protection by IPAB, the deposit insurance agency, of bank liabilities after the year 2003. It was necessary to provide more certainty for counterparties' operations in case of bank defaults, as repos will no longer be protected by deposit insurance. A new bankruptcy law, approved in 2000 permits holders of repo collateral to terminate in advance their repo operations by netting their rights and obligations with the defaulting counterparty. Prior bankruptcy laws required market participants to first settle their obligations and then collect their rights out of the bankruptcy proceeds.

The central bank has also made major efforts in developing an efficient and well regulated domestic derivatives market. In fact, a derivative market for foreign exchange products in Mexico has existed for the past 15 years. On the fixed income securities side, such markets started to develop at the beginning of the 1990s, with the creation of an interbank non-regulated forward market for inflation-indexed securities. However, the experience was not successful as the lack of regulation and internal controls of financial institutions led some of them to take large positions, causing large losses to some banks and brokerage houses.

With this background in mind, the central bank decided to regulate and monitor derivative markets more closely and to issue regulations for banks and brokerage houses. These regulations envisage, among other things, obligations to have middle offices reporting directly to top management, adequate risk measurement systems, risk committees with clear guidelines, and procedures and risk limits. Only banks and brokerage houses that comply with these regulations can trade derivatives in Mexico. Almost all of the major institutions in Mexico have complied with these regulations and are authorised to trade derivatives. Currently, there is a liquid market for foreign exchange forwards and options. In addition, a forward rate agreement market for the 28-day interbank equilibrium interest rate (TIIE) has started to develop as well as a small swaps market (fixed for floating) that goes up to 10 years.

The growth of mutual funds has been constrained by the dominance of banks and by regulatory restrictions limiting the percentage of assets that mutual funds could invest in short-term instruments. Financial regulators considered that mutual funds should specialise in holding long-term securities and thus they imposed limits on short-term investments. However, this restriction impaired the ability of mutual funds to compete against banks for customers. In a financial environment characterised by a high degree of interest rate volatility, investors tend to move away from funds invested in long-term securities as they will be exposed to sharp changes in the value of their investments. Moreover, mutual funds were not able to adjust the duration of their portfolios in response to expected increases in interest rates, since they faced restrictions regarding their investments in short-term instruments.

[10] One example is the Principles for Systemically Important Payment Systems.

During periods of stress, fund investors moved their savings to banks that offer shorter-term maturities.

To promote the development and growth of these funds, the central bank has been gradually making regulation more flexible. Financial authorities are also working on regulations that will allow the creation of families of pension funds subject to different investment requirements to satisfy the different risk-return appetites of their customers.

Recent changes in the laws that regulate mutual funds move substantially in this direction, permitting the development of a wide variety of collective investment vehicles that must make clear in their prospectus the structure and investment objectives. The new laws open the door to the existence of short/long funds, hedge funds and funds of funds (umbrella funds). The new regime will also permit a single mutual fund to charge different fees to different classes of investors and opens the possibility for financial and non-financial entities to obtain authorisation from the Banking Commission to be distributors of funds. The ability to differentiate the pricing of products will help the industry to market customised products to the more sophisticated investors, and the existence of more distribution channels will increase competition.

Transparency and information

Important elements for the development of sound secondary markets are the existence of market-determined prices and the enforcement of the valuation to market prices of financial intermediaries' securities positions. BM has been active in developing schemes to provide participants with easy access to market information. To enforce regulations that oblige financial intermediaries to mark to market their security positions held for trading purposes, the central bank made some early efforts in conjunction with the Mexican Stock Exchange to publish daily market prices for all tradable fixed income securities. The enforcement of mark-to-market standards for securities valuation eliminates incentives to hold securities whose prices have decreased in order to avoid registering losses. This early effort to provide the market with prices failed because, very often, published data were unreliable as they depended on information supplied by financial intermediaries themselves.

More recent efforts, by a working group comprising BM, the Banking Commission and industry representatives, led to the creation of private "price vendors". These recently created entities are in charge of compiling market information from intermarket brokers and selling it to market participants. Price vendors should receive the approval of the Banking Commission to operate. However, the methodologies, models and inputs used to obtain prices along the yield curve are determined entirely by each price vendor. Currently, banks, brokerage houses, mutual funds, pension funds and insurance companies are required to obtain the services of a price vendor. Since 1999, BM also publishes on a daily basis information on government securities prices through its website to serve as a benchmark to evaluate the performance of price vendors.[11]

Determination of reference-market rates

Before the introduction of voice and electronic interbank brokers, transactions among banks in the money and debt markets were mostly carried out by phone. Market participants, other than banks and brokerage houses, did not have access to any information regarding prevailing market interest rates. Information available to financial institutions was frequently incomplete and often not timely. Thus, market participants could not use any interest rate other than those determined, once a week, at government securities auctions as a reference rate for the different financial operations such as credits, futures, forwards and swaps. As part of the central bank's effort to develop market references for participants, BM developed a mechanism to determine day to day a market-based interbank interest rate. This market reference rate, known as TIIE, has become a benchmark for bank loans, security yields and underlying rates for futures and swap markets.

Currently, BM determines a 28-day TIIE every day, and once a week a 91-day TIIE. In particular, the 28-day TIIE has become a very important benchmark for the market. For instance, almost all private

[11] BM also publishes the methodology used to estimate the prices.

floating rate debt is related to it, as well as a large proportion of bank loans and the most liquid interest rate derivatives. The methodology to determine the TIIE uses bid-ask quotes presented by financial intermediaries to BM. Intermediaries know that BM can either borrow money from, or lend it to, them at those rates. Participation in these sessions is voluntary, but is open only to commercial banks.

Recently 14 of the major banks in Mexico launched their own reference rates. These new rates, known as Mexibor, are determined directly by the participating banks, based on market conditions, and include the yield curve up to a year. It is foreseen that, in the near future, Mexibor rates will substitute the TIIE as the basic reference.

In addition to the TIIE, in 1999 BM started publishing a daily weighted average of both the overnight interbank rate and the overnight repo rate for government securities. The figures are generated using data from operations settled in the DvP system operated by BM and Indeval. These reference rates have also become important as some issuers use them to price floating rate notes. In addition, some intermediaries are working to develop an overnight index swap market using these rates as market references.

4. Final remarks

Over recent years, Mexican domestic government debt markets have experienced remarkable growth, as macroeconomic stability has been consolidated. In particular, the decline of inflation has enabled the government to increase the duration of its debt, creating a yield curve in fixed rate instruments that goes up to 10 years. In addition, the creation of "market-makers" has provided liquidity to the market, making it more efficient. The Mexican securities market now has prices for the complete yield curve. However, there is still work to be done and the authorities are concentrating on the following issues:

- *Operating the repo market under international standards*. This would include working with the financial intermediaries in designing master agreements, and changes in regulations to facilitate haircuts and margin calls for these operations.
- *Facilitating short selling in the market.* Although short selling is allowed, it is seldom used because of difficulties in borrowing securities in the market. In fact, only market-makers have access to a securities-lending window at the central bank. To facilitate short selling, it is important to work on regulations to permit institutional investors to lend their securities. Finally, it is also important to work with the large custodian banks and with the clearing system (Indeval) on operational mechanisms that can make securities lending an active market.
- *Increasing the liquidity of government securities.* The increase in liquidity has concentrated on certain sectors of the yield curve. In addition, inflation-linked and floating rate government bonds continue to be illiquid instruments. In this respect, there are two main areas where additional work needs to be done. First, to increase the liquidity over the complete yield curve, the rules pertaining to the measurement of the activity of the market-makers should be changed so as to create incentives for trading in all of the important nodes of the yield curve. Secondly, international experience has shown that is very difficult to create a liquid market for floating rate and for inflation-indexed bonds. Therefore, the government and the central bank should look for strategies aimed at relying less on these securities.
- *Developing a corporate debt market.* In developed financial markets, corporate debt has proven to be a very efficient way to fund the private sector. For investors, corporate securities have been an important means to increase the yield of their investments. For the economy, these instruments have contributed to market efficiency, since they represent a transparent mechanism that determines the interest rate levels that are consistent with different credit risks. In Mexico, the development of this market has been extremely slow. In fact, in 1995 the market almost disappeared. Many important issuers ended up either defaulting or restructuring their debt without any previous advice for investors casting doubts about the reliability of credit ratings.

Over the last three years this market has started to reappear, due to the emergence of the major credit rating agencies in Mexico.[12] In addition, regulators have indirectly forced issuers to rate their instruments by obliging institutional investors such as mutual and pension funds to invest only in corporate securities that are rated by one of these major agencies. Notwithstanding, primary placements have been sporadic, usually from companies with high credit ratings, and geared towards a specific segment of the market, mainly the pension funds. One reason for this has been the lack of investment grade companies willing to fund themselves in this market. Another has been a very restrictive regulation oriented to institutional investors and financial intermediaries, in part as a consequence of the experiences of 1995.

Regarding the development of the corporate securities market, the basic framework has been established through reliable credit ratings and improved risk management performed by institutions. As long as this process of gradually building a well thought-out corporate securities market continues, some relaxation of the current regulation could be considered. In particular, there are proposals to allow institutional investors to invest in lower credit quality securities. Banks and brokerage houses could be authorised to conduct repo operations with these securities, in order to increase the liquidity of these instruments.

- *Asset securitisation* appears to be not only an alternative method of funding but also a necessary step in the development of a more liquid Mexican debt market. Mexican banks[13] and non-bank banks have already successfully issued asset-backed securities, mostly through private placement operations or through their foreign branches. Securitised assets in these operations range from credit card receivables to mortgages. However, international experience shows that mortgages are the primary source of these transactions. In Mexico, the mortgage market is still small and fragmented.

  Mexico does not have the complete legal infrastructure required to promote the development of securitisation schemes. Moreover, at present, asset sales from the originator to the vehicle are taxed, unless the originator retains the right to buy back the assets. This conflicts with prudential issues such as the convenience of a legal and economic separation of assets between the originator and the vehicle as advocated by the Basel Committee's new draft Capital Accord. Additionally, it appears essential to establish disclosure requirements in the prospectus about the most relevant features of the asset-backed securities.

  Asset-backed paper can promote the development of longer-term issuances in the Mexican debt market. Institutional investors with long-term liability structures have traditionally favoured equity and government bonds. Their appetite for unsecured long-term corporate risk can be satisfied by issuance of securitised assets.

- *Consolidating a more sophisticated and liquid derivatives market.* Derivatives have been a natural complement for the spot fixed income markets, since they enhance their liquidity. In Mexico, although a liquid foreign exchange derivatives market operates, interest rate derivatives have been developing very slowly. This has partly been due to the lack of credit that the economy has experienced in the last seven years, which has inhibited the demand for hedging instruments. However, now that a fairly liquid yield curve in pesos exists, and credit is starting to reactivate, it is important to promote forward rate agreements referenced to longer-term interest rates as well as to increase liquidity in the interest rate swap market.

[12] Standard and Poor's, Moody's and Fitch-IBCA operate in Mexico.

[13] Banamex has been particularly involved in several asset securitisation schemes. In 1999 this bank issued through its Nassau branch $250 million in certificates backed with credit card merchant receivables. More recently, in March 2001, Banamex issued through a private placement scheme $150 million of certificates backed with e-commerce receivables.

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The development of debt markets in Peru

Marylin Choy

1. Introduction

The market-oriented reforms implemented since 1990, along with the recovery of macroeconomic stability, has encouraged the growth of the still small capital market in Peru.

However, the results have not been as good as expected. There are now important institutional investors and the market has a number of financing alternatives for corporations, but the number of firms – in particular medium sized enterprises – that have accessed the market is still low and Peru still lacks a government securities market.

The capital market dynamics observed in the last decade suggest that its growth and development to international standards will still take some time. Further reforms are needed, but the positive results already achieved are the best incentive to pursue them.

2. Primary debt markets

An overview

Beginning in 1990, Peru implemented a market-oriented reform package that included a set of laws expected to boost the development of the capital market. Since then, and complemented by the sustained achievement of macroeconomic stability, some Peruvian firms have used the capital market as an additional vehicle to bank credit in financing their operations. Some firms have even accessed developed capital markets, such as the United States, to raise capital through American Depository Receipts.

However, this reform package has not yet yielded decisive results. As the long-run horizon that disappeared with the hyperinflation process of the 1980s is still absent, there is almost no long-term financing available, either in the banking system or in the debt market.

Table 1

Private bonds outstanding, by maturity

(millions of US dollars)

Year	< 3 years	3-5 years	> 5 years	Total
1994	212	112	0	324
1995	244	351	0	595
1996	330	717	8	1,054
1997	419	920	92	1,432
1998	443	1,193	169	1,804
1999	491	1,093	300	1,885
2000	486	1,065	733	2,284
2001	473	933	981	2,387

Source: Central Reserve Bank of Peru.

This outcome reflects some structural factors that delayed the development of the debt market. There are two important characteristics of non-financial firms:

- The entrepreneurs' financing culture is highly linked to banking. This practice has allowed the firms to maintain a certain lack of transparency on their financial statements, as compared to the requirements for issuing debt or equity in the capital market.
- Many firms are still family-owned. This aspect of their corporate governance can be a problem when the firm lacks enough capital to finance the acquisition of new technology. This delays productivity improvements, bringing a decline in competitiveness.

Table 2 shows the evolution of the main sources of funds for the private sector since 1995, and the amount of bonds issued by financial institutions (subordinated debt and leasing bonds).

Table 2

Funding of non-financial firms

(outstanding stock at end-year; billions of US dollars)

Year	Bonds	Bank credit	Total	Memo item: Bonds issued by financial institutions
1995	0.2	8.2	8.5	0.4
1996	0.5	10.9	11.4	0.6
1997	0.7	13.8	14.5	0.7
1998	0.8	14.5	15.3	1.0
1999	0.9	13.9	14.8	1.0
2000	1.2	13.4	14.6	1.1
2001	1.3	13.4	14.7	1.1

Source: Central Reserve Bank of Peru

Banks continue to dominate the Peruvian financial market, with bank credit still the primary source of funding. Peruvian capital markets are complementary to bank credit in financing private corporations. In 1999, and particularly in 2000, the reduction in bank credit was partly offset by the funds raised in the capital markets. Nevertheless, in 2001 bank credit contracted as a consequence of the slowdown in economic activity.

Going back some years, it is important to remember that the "El Niño" weather phenomenon affected Peru in 1998, provoking a slowdown in economic activity. Its impact was reinforced by the aftermath of the international financial crisis, which severely affected the local economy, especially after the Russian financial crisis of October 1998. That year was a turning point in the availability of foreign credit lines to the local banks: in the following 12 months these mostly short-term lines were reduced by US$ 1 billion. This significantly restrained the domestic banks' foreign exchange liquidity (as those facilities had reached a level of approximately US$ 3 billion in previous years) and led to a severe contraction in bank credit. In order to diminish the adverse impact, the central bank reduced reserve requirements on bank deposits by 3 percentage points (freeing approximately US$ 450 million).

The government's debt management policy also played a role in capital market development. In the 1990s, government debt issuance was minimal, as a result of generally balanced budgets, the privatisation process and a strategy of not issuing domestic debt, but focusing on external financing through the Paris Club and multilateral loans. This in turn had two main consequences:

- The lack of a yield curve, which limited the development of efficient risk management techniques by domestic institutional investors, and also risk diversification.
- The very limited role of securities issued by sovereign borrowers in institutional investors' portfolios.

Hence, there was no benchmark for long-term debt in domestic currency, and, due to the high degree of dollarisation[1] in the economy, bonds with a maturity longer than one year were issued in the local currency but indexed to inflation or in dollars with the issuer bearing the implicit exchange rate risk.

Table 3

Private and public bonds outstanding

(millions of US dollars)

	Private sector				Public sector		
Year	**Foreign currency**	**Local currency: nominal**	**Local currency: indexed**	**Total**	**Foreign currency**	**Local currency**	**Total**
1992	67	0	0	67	...	...	18
1993	116	0	0	116	...	...	14
1994	296	0	28	324	...	...	295
1995	483	4	108	595	...	...	339
1996	669	42	343	1,054	...	...	295
1997	825	44	563	1,432	...	...	262
1998	1,259	18	527	1,804	...	...	270
1999	1,404	17	464	1,885	903	155	1,058
2000	1,774	21	489	2,284	917	137	1,054
2001	1,801	113	473	2,387	1,248	437	1,685

Source: Central Reserve Bank of Peru

The Peruvian dollarisation process reflects two factors. First, Peru suffered a prolonged inflationary process until the beginning of the 1990s, which eroded the public's confidence in the local currency. (The issuance of inflation-indexed instruments has surged only during the last few years.) Second, the availability of foreign credit lines, which currently total US$ 1.9 billion, helped to finance bank loans.

As a consequence, 81% of total bank credit, and most debt instruments, are denominated in US dollars. In 1999 and 2000 the Treasury issued US dollar-denominated debt instruments with a five-year maturity to finance its assistance to some financial institutions that initially faced liquidity problems and later a high proportion of non-performing loans. At the same time, some bonds were issued to implement rescue mechanisms for non-financial firms (agrarian and non-agrarian) but with a 15-year maturity. One problem derived from the issuance of foreign currency-denominated debt instruments is that the budget becomes more exposed to exchange rate risks, since most of the government revenues are denominated in local currency.

Instruments

By the end of 2001, the stock of bonds (issued by private corporations and financial institutions) authorised for issuance in the Public Registry was US$ 4.0 billion and the amount actually issued was US$ 2.2 billion, of which corporate bonds represented US$ 0.9 billion.

Around 80% of corporate bonds are rated investment grade (BBB, A, AA, AAA). The rest are considered speculative grade (BB or lower). Any private debt security must be rated by at least two

[1] More than 75% of the deposits in the banking system are denominated in dollars.

rating agencies. Two of the three domestic rating agencies operating in Peru are associated with international credit rating agencies.

The main debt instruments issued in the Peruvian capital markets are bonds, mostly linked to leasing, corporate and subordinated debt.

Table 4

Private bonds outstanding

(millions of US dollars)

	Corporate	Leasing	Mortgage	Securitisation	Subordinate	Total
1992	1	66	0	0	0	67
1993	12	104	0	0	0	116
1994	89	202	0	0	33	324
1995	208	291	0	0	96	595
1996	472	371	0	0	211	1,054
1997	699	450	0	0	283	1,432
1998	782	695	0	15	312	1,804
1999	813	757	0	39	276	1,885
2000	1,029	824	0	160	273	2,286
2001	931	816	25	247	274	2,293

Source: Central Reserve Bank of Peru.

Securitisation and the issuance of short-term securities (mainly commercial paper) face encouraging prospects. Very recently, and for the first time, a Peruvian corporation issued bonds based upon the securitisation of its cash flows over the next five years (US$ 50 million). Previously, credit card receivables had been securitised by one bank and another arranged two programmes of asset securitisation.

From the investors' point of view, one problem with the Peruvian capital markets was that most of the debt issued had been at floating rates, which complicates the valuation process. This characteristic is expected to disappear eventually, since interest rates are declining for both local and foreign currency issues, and the rate of inflation has been brought down to international levels.

The maturity of debt instruments has been lengthening as a consequence of the stabilisation of the economy and the increasing importance of institutional investors: the current average maturity is longer than five years, while it was shorter than five years in the middle of the 1990s.

Maturities are also related to the type of instrument. Banks issue subordinated bonds with long-term maturities (up to 10 years), similar to their affiliates' leasing bonds, while the corporate bonds issued are mostly medium-term (between three and five years).

Regulation is improving through "learning by doing". The standardisation of instruments' characteristics and the information transparency requirements have been the most important improvements. Both developments have enhanced the participation of new investors (local and foreign). Many local firms are now issuing debt instruments in compliance with international standards, especially those regarding the level of information.

Investors

Private pension and mutual funds, both in operation since 1993, are the more active investors. Currently, pension funds manage US$ 3.2 billion and mutual funds US$ 0.4 billion. All investors, including institutional investors and banks, use brokers to trade in the stock exchange.

Table 5

Holders and issuers of domestic debt securities

(billions of nuevos soles, end-2001)

	Issuers			
Holders	**Financial institutions**	**Central bank**	**Public sector**	**Corporate**
Central bank	...	.	0.36	...
Banco de la Nación	...	0.23	1.47	...
Banks	...	1.27	2.40	...
Private pension funds[1]	1.84	0.34	0.95	2.09
Others[2]	1.85	...	0.46	2.44

[1] November 2001. [2] Mainly mutual funds and insurance companies.

Source: Central Reserve Bank of Peru

All investors have the same opportunity of access to government and central bank securities. Most of the transactions in private sector instruments are conducted through private dealers or by public auctions. In this sense, the market for private debt instruments could be described as a hybrid.

3. Secondary debt markets

Peru has only one stock exchange, located in Lima, where equities and some debt instruments are traded. The transactions are undertaken electronically, with every order placed in a queue and then matched electronically by price on a continuous market.

There are no “market-makers”, no specific institutions that hold a portfolio of instruments and regularly quote both bids and offers, being ready to make a two-sided market. However, market-makers are expected to emerge in the medium term, given the increasing importance of institutional investors. Foreign investors were active when the Lima Stock Exchange was experiencing a boom, during the first half of the 1990s.

The Peruvian secondary market for both public and private securities is neither liquid nor dynamic, even though the fees charged by intermediaries seem to be competitive by international standards. The market is also highly sensitive to any political or financial event, making it volatile and risky.

The liquidity of the market reflects the low scale of operations prevailing and the low number of securities traded. The main buyers are the institutional investors, mainly private pension funds. As their funding exceeds the supply of securities they act as “buy-and-hold” investors.

This lack of liquidity leads to high transaction costs. The market does not allow investors to realise a profit opportunity, because the market prices might collapse with just a small sale of securities. Another problem is that it is difficult to mark to market any portfolio.

The decreasing interest rate expectations also affect the dynamics of the market, promoting a “buy-and-hold” strategy. These expectations are based upon the achievement of macroeconomic stability, the declining international interest rates and the recovery of Peruvian financial deepening (between 1990 and 2001, bank credit grew from 5% to 26% of GDP).

Another problem that influences the dynamics of the capital market is the lack of sufficient information to value portfolios properly and to assess the true value of the outstanding debt securities in the market.

To overcome these problems, policymakers have been working to improve the availability of information in the market and the soundness of financial statements. However, one remaining problem

is the lack of a liquid government securities' market to adequately shape a yield curve, which would be a useful reference for the valuation process.

4. Interactions between debt markets and banks

The largest players in the domestic money markets are banks, and the most important money markets are those for bank reserves and central bank certificates of deposit. The latter are used by the central bank to execute its monetary policy. The decline in bank credit has increased the excess liquidity held by the banks. Currently, US$ 0.5 billion (almost 17% of domestic currency denominated bank credit) of this has been invested in central bank CDs.

Debt instruments issued by Peru's largest corporations operating are very much in demand by institutional investors because of their creditworthiness. Furthermore, those corporations were issuers of debt in 1999 and 2000, when the capital market partly offset the reduction in bank credit. It is evident that banks and institutional investors compete to lend resources to the same borrowers, who take advantage of this fact and seek to obtain better credit conditions (longer maturities and lower interest rates).

The decrease in the quality of bank loans over the last three years has not been the result of the development of the capital markets. The deterioration is rather a consequence of other factors, mainly the international financial crisis and the slowdown in economic activity.

As stated above, the market for securitising bank-originated assets is not yet developed. There have been just two issues of such securities, both in 1999 and carried out between related companies.

In the 1990s, the capital markets and banking credit complemented rather than substituted for each other. The bank credit contraction which began in 1999 did not happen because of competition from capital markets, but due to problems derived from the management of information asymmetries.

Issues of commercial paper have been at the issuer's own risk. The participation of banks has been limited only to the process of structuring and offering.

5. Forces for change

Domestic debt markets and macroeconomic conditions

At the beginning of the 1990s, the return of macroeconomic stability was one factor that foreign investors considered as boosting Peru as a serious investment opportunity. It also allowed local firms to make long-term plans, encouraging investment and giving the right incentives to the issuance of debt as a financing vehicle.

These events paved the way for a credit boom that promoted private spending, which in turn boosted GDP. However, only the big firms took advantage of the capital markets. Small and medium-sized firms financed their investments by using short-term bank finance.

The fact that inflation has been almost halted has helped lengthen the maturity spectrum of debt securities. Market interest rates in domestic currency declined significantly in 2001, providing an incentive for local currency securities issuance. In 1995, the average term of a debt instrument was around five years; currently, it is around 10 years.

Social security reform

The social security system was reformed in 1993. Besides the objective of providing pensions, the reform was also intended to boost development of the local capital market. Currently, the pension funds manage a portfolio of US$ 3.2 billion. Table 6 shows the main legal limits on their investment portfolios.

Table 6

Investment portfolio of private pension funds

	Legal investment limits	Structure of portfolio
	(% of administered fund)	
Government and central bank securities[1]	40	11.9
Bank deposits and bonds issued by financial entities[2]	40	37.5
Subordinated bonds issued by financial entities	15	3.5
Bonds issued by corporations	40	12.9
Debt instruments issued for project finance	4	0
Stocks in local and foreign markets[3]	47.5	29.0
Others	65	5.2

[1] The limit for investment in Peruvian Brady bonds is 10%. As of October 2001, the share of investment in this instrument was 5%. [2] The limit for investment in bonds issued by financial entities is 25%. As of October 2001, the share of investment in this instrument was 12.3%. [3] The limit for investment in foreign securities is 7.5%. as of October 2001, the share of investment in this instrument was 4.1%. It also includes stocks acquired in the privatisation process (5% of the administered fund as of end-1999).

Investment by pension funds in domestic securities is not subject to any minimum credit rating. However, the lower the rating, the larger is the applicable reserve requirement.

A challenge for pension funds is that their funds are growing faster than debt issuance by local firms, a problem aggravated by the current state of economic activity. In 2000, pension funds were allowed to invest in securities transacted on foreign markets; currently, they may invest in Peruvian Brady bonds (10% of the portfolio) and in investment grade foreign securities (7.5% of the portfolio). Allowing investments abroad makes the portfolio more flexible and allows risk diversification, but it means that Peru is exporting capital. This issue is highly controversial, since Peru continuously shows a deficit in capital investment.

Pension fund investment in local corporate debt instruments benefits the largest firms. However, it does not help small and medium-sized firms, as they cannot afford the administrative costs implicit in any debt instrument issuance and obtaining a credit rating. These limitations make it easier and cheaper for them to use the banking system to finance their growth.

Despite these problems, pension funds constitute an important vehicle that supports the development of the debt market.

The fiscal role

In the 1990s, Peru accessed multilateral support programmes and regained access to international credit, particularly after the Brady agreement. The public sector did not access the Peruvian capital markets to finance its operations directly until very recently, when it issued local currency denominated bonds with maturities of two and three years. As expected, the demand for the instruments was generally greater than their supply.

Beginning in February 2001, the government has issued local currency denominated bonds for a total of 1.2 billion new soles (US$ 300 million) with two- and three-year maturity. Each issue is announced some weeks in advance, through its own prospectus. Bonds have been issued through public auctions, following the Dutch system. To the extent that investors' expectations for balanced budgets are met, the demand will be strong enough to allow for successful future issuance, which in turn will facilitate the formation of a liquid and dynamic market for these securities.

The lengthening of the maturity of government bonds is also helping to establish a benchmark for interest rates for longer maturities. Nevertheless, the scarcity of investment alternatives and the need of private pension funds to comply with portfolio limits restricts the possibility of a well developed secondary market, which in turn impedes the establishment of a yield curve. This situation is expected to change once the outstanding stock of public securities reaches a sufficient size.

Table 7

Treasury bonds

Date of issue	Maturity	Amount issued (millions of new soles)	Yield to maturity (%)
9 March 2001	2 years	100	12.5
5 April 2001	2 years	100	12.5
21 June 2001	2 years	54	12.5
21 June 2001	3 years	96	13.1
5 July 2001	2 years	51	12.4
5 July 2001	3 years	99	13.1
24 Sept 2001	2 years	250	10.5
15 Oct 2001	2 years	200	10.0
5 Nov 2001	2 years	150	9.2
5 Nov 2001	3 years	100	9.8

Source: National Securities Commission.

Monetary policy role

The main concern of monetary policy in Peru is maintaining price stability, which in turn reduces the long-term risk of any investment. Since investment is the main means to increase output and employment, the guarantee of price stability helps to ensure economic growth.

In order to accomplish its objective, the central bank uses market instruments to manage the amount of money in the economy. In doing this, its operational target is the daily average of the reserves held by the banks in current accounts at the central bank.

The monetary instruments are the reserve requirements, the discount window, open market operations, repo operations and swaps. The central bank may intervene in the foreign exchange market selling and buying dollars depending on the market conditions.

The central bank launched its open market operations by auctioning its own paper (CDBCRP) since there were not enough Treasury bonds in the market or held by the central bank. When the central bank needs to withdraw liquidity from the market it sells its CDBCRP. The main buyers are banks and private pension funds.

When the market needs more liquidity the central bank conducts repo operations using the CDBCRP and government bonds. The interest rates are then set by the market. Rates declined substantially during 2001 as inflation fell. The outstanding amount of CDBCRP is more than 25% of the money base.

High rated corporate bonds are also accepted as collateral for central bank credit. To the extent that the availability of such securities is still low, the existence of the collateralised credit facility may become an incentive for the banks to “buy-and-hold” these securities. At the same time, an extra distortion might be added by the collateralised credits. It gives an arbitrage opportunity to the issuers; because their paper will be sought after by banks, they may be able to raise funds at a lower cost.

Table 8

Central bank certificates (interest rates)

Date of issue	18 weeks	20 weeks	6 months	1 year	**Total stock** (millions of new soles)
Dec 2000	14.5	13.0	14.2	..	1,360
Jan 2001	13.0	13.1	13.1	13.2	1,950
Feb 2001	12.3	12.1	.	12.9	1,995
Mar 2001	11.6	12.0	11.7	12.9	2,055
April 2001	.	.	.	.	1,745
May 2001	.	13.5	.	.	1,665
June 2001	.	11.0	12.1	12.0	1,740
July 2001	10.9	11.2	.	11.7	1,515
Aug 2001	10.1	10.1	9.4	10.4	1,960
Sept 2001	.	.	8.0	9.1	1,990
Oct 2001	.	.	6.9	8.3	1,805
Nov 2001	.	4.8	5.8	6.6	2,025
Dec 2001	3.3	.	3.9	5.3	1,840

Source: Central Reserve Bank of Peru.

Nevertheless, these open market and repo operations help to develop the capital markets since they give liquidity to the paper in question and are an important variable for signalling interest rates to the market. However, since these operations' maturities run only from one week up to one year, they do not contribute to the long-term yield curve.

International debt issuance

Neither the government nor the private sector has issued debt instruments in international capital markets. The emergence of institutional investors as important funds suppliers was an important reason to stay in domestic markets. The corporate firms have been able to get funds at more reasonable rates than those available in the foreign markets. Another factor that limits the access to foreign debt market financing is the fact that sovereign risk perception is still high.

The aftermath of the financial crisis, the "El Niño" weather phenomenon and the political crisis were factors that negatively affected the perception of Peru's sovereign risk. However, the successful negotiation of the Brady bonds programme allowed Peru to be considered as creditworthy again in the international capital markets. It also helped Peruvian banks to obtain direct commercial and financing lines of credit that were transferred to local firms.

However, the government is working on a programme for issuing bonds in the international market, which should give investors a long-term benchmark.

6. Enhancing the liquidity of bond markets

One aspect that affects liquidity in the bond markets is expectations of further decreases in interest rate and the scarcity of alternative investments in the market. This leads the institutional investors to "buy-and-hold". The size of the country also matters to the extent that this has effects on the scale of operations of corporate firms.

However, taking into account that bank deposits are still low by international standards (25% of GDP) and that institutional investors play an even more important role, the capital markets are seen to have good prospects once the country regains its path of economic growth.

To the extent that the government successfully manages its fiscal deficit and macroeconomic stability is consolidated, the creditworthiness of, and demand for, government securities will improve. One element that sooner or later should be introduced in the government bond market are market-makers, agents that ensure the negotiability and liquidity of such securities.

The central bank is interested in this development, since it could use the yield curve as another instrument to monitor its objectives. One alternative could be the central bank's CDBCRP, but the problem is that the amount outstanding is just the amount required to execute the monetary policy. In the issuance of such securities, the central bank does not have in mind the requirements of the institutional investors to hold investment portfolios with a long-term outlook. As a result, the stock of CDBCRP does not allow continuous trading. The maturities of the CDBCRP are very short, only going up to one year.

On the other hand, the "buy-and-hold" behaviour of the large investors should alter in line with the development of the capital markets, as a larger number of instruments start to be traded.

The globalisation process that affects markets worldwide will also influence the development of capital markets in Peru. One of the relevant facts is consolidation of the banking industry. In many Latin American countries, Spanish banks are playing a large role in this process; Citigroup recently took a big stake in Mexico. It is very likely that these institutions invest their idle cash in highly marketable securities, such as governments bonds, but essentially in bonds issued by the country where their operations are undertaken. Therefore, these banks are diversifying their exposure in different countries not only by investing directly. However, the correlation among markets in Latin America is still very high, and that should limit such diversification.

The growth of other institutional investors such as mutual funds will also help to develop a liquid market since these investors may be more active in the market. However, it is important to increase the number of participants not only on the demand side of the market but also to encourage the entry of new issuers.

Are extra reforms needed to develop capital markets?

Most of the requirements for a buoyant secondary market seem to be in place in Peru. However, there are some complementary reforms that could help promote the secondary market, as well as the introduction of market-makers for government securities.

In the development of capital markets, size and liquidity matter. For this reason, it is necessary to encourage medium and small firms to issue debt in the capital markets, by persuading entrepreneurs of the benefits of capital markets for financing their growth. Disclosure of more transparent financial information is important to empower minority stakeholders. Improved corporate governance would increase the flow of capital into the economy.

One expected consequence of such reforms is the broadening of the range of debt instruments traded in the capital markets. It is also necessary that firms have access to more information about the financing alternatives provided by the capital markets. The emergence of more consultancy firms will complement the extension of possible instruments to be issued, since they may help to inform firms about the possibilities and advantages of the capital markets.

At the beginning, many debt arrangers competed in the capital market by structuring very complicated debt instruments, including special provisions and options. These instruments were too sophisticated for the investors. Besides broadening the range of debt instruments, it is important to encourage the issuance of standard debt instruments, as well as enhancing the creation of markets that could be used to hedge positions on different debt instruments.

Debt market development: challenges for the central bank in Poland

Jerzy Stopyra, Anna Trzecińska and Agnieszka Grat[1]

1. The Polish Treasury securities market

The debt instruments issued by the Polish government to cover the budget deficit can be divided into two groups. The first consists of Treasury bills, short-term papers with maturities of up to 52 weeks in denominations of PLN 10,000. They are offered for sale on the domestic primary market at a discount in the American-style auction system every Monday. Secondary trading takes place in an unregulated OTC market. About 15 banks offer quotes. It is a well developed segment of the financial market in Poland, although its liquidity is declining due to the decreasing issuance of T-bills and the growing involvement of non-banking institutions that hold them to maturity.

The second group of debt instruments comprises Treasury bonds, long-term papers with maturity of up to 10 years, which come in various types (Table 1). They are issued through monthly American-style auctions. Only the entities having the status of a "direct participant" can bid in the auctions for Treasury bonds. Other market participants wishing to bid must do so through these intermediaries. Both T-bills and T-bonds are issued in dematerialised form.

Table 1

Classification of Treasury bonds

	Marketable	**Non-marketable**
Wholesale	2- ,5- and 10-year fixed rate bonds 10-year floating rate bonds	restructuring bonds
Retail	3-year floating rate bonds 5-year fixed rate bonds	2-year fixed rate savings bonds 4-year CPI-indexed savings bonds

At the end of 2000, the majority of Treasury securities outstanding were fixed rate marketable bonds. The liquidity of the T-bond market improved markedly in recent years, with gross turnover almost doubling since the mid-1990s. The most liquid T-bonds were those with a five-year maturity. The ten-year bonds were mainly bought by pension funds, which tended to hold rather than trade them.

2. Registration and the cost of trading Treasury bonds

Whereas T-bills are registered with the National Bank of Poland (NBP), T-bonds are registered with the National Depository System (NDS). T-bonds are traded on the Warsaw Stock Exchange, over the counter, and on a non-regulated interbank market. Transaction costs are much higher on the regulated market; as a result, 98% of the volume of transactions is carried out on the non-regulated interbank market. This has the following consequences:

[1] First Deputy President, Director of the Monetary and Credit Policy Department, and Senior Specialist in the Monetary and Credit Department of the National Bank of Poland, respectively.

- the volume of T-bonds issued is much higher than their turnover;
- the costs imposed by the NDS discourage the use of repos and the system for outright trades. A double fee (sale and purchase) is charged on repos, making short-term repos prohibitively expensive;
- transactions made via the NDS, in theory, are on a DvP T+2 basis (net settlement in cash and gross settlement in securities); and
- some trades are cash-settled outside the NDS. Banks send the NDS an order to shift securities while transactions are settled separately through the banks' accounts with the central bank.

The NBP has purchased about 30% of the NDS. The NBP's representatives on the supervisory board of the NDS are pushing for appropriate action to promote market liquidity.

3. Legal and institutional aspects

Repo agreements have become the major instrument for liquidity management by financial market participants. However, T-bonds are not used for repo transactions, even though this is legally possible. This effectively reduces the amount of collateral available in the interbank market, and may increase marginally the cost of T-bond issue by increasing the liquidity premium. As the central bank has regulatory responsibility for the money market, it is supporting proper legislation contributing to the safety and transparency of financial markets. In particular, the NBP has worked with the Polish Banking Union to prepare a repo framework agreement so that market participants do not enter into repo transactions without sound legal documentation.

Another concern for the NBP is that there are as yet no regulations concerning securities lending agreements. The Civil Code in Poland does not recognise such a form of transaction. The law on the public trading of securities only allows for securities trading under the following conditions:

- the NDS may use securities lending in order to ensure the liquidity of transactions; and
- on the regulated market, only brokerage houses and banks conducting brokerage activities may conclude securities lending agreements for the purpose of short selling.

These legal circumstances make it difficult for the central bank to further stimulate development of the T-bond market.

4. Role of the central bank

The NBP influences the financial system and market liquidity not only by means of monetary instruments – credit and open market operations, obligatory reserves – but also through the payment system and supplementary instruments. For example, the NBP rates commercial banks for their activity in the Treasury securities market, and on this basis selects counterparties for its transactions.

With the ongoing globalisation of financial markets, maintenance of stability, liquidity and transparency in the financial system has become a vital function for the NBP. To fulfil this function, the NBP is actively cooperating with the Ministry of Finance in a number of areas. For example, the Ministry of Finance plans to introduce a primary dealer system in 2002, which is expected to help improve liquidity of the T-bill market by encouraging banks to carry out transactions on an electronic platform. The primary dealer system should also help boost market transparency by providing more information on quoted prices and making it easier for pension funds to value T-bonds.

5. Reform of the National Depository System

The NDS is concerned that introducing a primary dealer system may boost turnover to such an extent that settling transactions in seven cycles a day, as at present, would no longer be sufficient to meet the demand for settlement services. The introduction of multibatching has increased significantly the number of transactions settled in T+0. To support future demand for faster settlement, the NDS plans to implement a clearing and settlement system similar to RTGS in 2003. A separate "real-time" bond settlement module is expected to become operational by mid-2002. When implemented, this settlement module could make the existing net cash settlement method less attractive. During 2002 principles and procedures will be drawn up for the introduction of repo transactions in the depository-settlement system.

The development of debt markets in emerging economies: the Saudi Arabian experience

Muhammad S Al-Jasser and Ahmed Banafe[1]

1. Background

Saudi Arabia has a short history of deficit financing. From 1983 to 1988 the budget deficit, resulting from falling oil revenues, was financed out of state reserves. Since mid-1988, government securities have been issued in the domestic market to fund fiscal deficits. The policy option has been to mobilise domestic savings with a view to developing a capital market. Saudi Arabia has not so far tapped the eurocurrency market for issuing its sovereign paper, but raised syndicated US dollar loans on two occasions during the 1990s. There are no restrictions on foreigners buying government securities through domestic banks, nor are there withholding taxes on coupon payments.

Government Development Bonds (GDBs), issued since mid-1988, carry fixed coupons payable semiannually. GDBs are offered to financial institutions every month in two-, three-, five-, seven- and 10-year maturities. Banks view GDBs as a hedge for their earnings against a decline in short-term interest rates, as a complementary asset to their loan portfolio, and as a means of meeting the liquid reserve requirement. Until December 1998, GDBs were priced off US Treasuries. Thereafter they were priced off the one-year Riyal Interbank Bid Rate (SIBID) to reflect domestic money market conditions. Faced with the yield curve inversion in the late 1990s and the fact that the banks use US dollar interest rate swaps as an alternative to GDBs, the pricing benchmark for GDBs was changed to these swaps (plus a discretionary spread) in November 2000.

In November 1991, Bankers Security Deposit Accounts (BSDAs – ie Central Bank Bills) were replaced by treasury bills, which are offered every week in various short-term maturities (one, four, 13, 26 and 52 weeks). T-bills are used for short-term cash flow management. BSDAs were identical to T-bills but their availability remained restricted to the banks, and the proceeds were not available for deficit financing.

Riyal Floating Rate Notes (FRNs) were introduced in late December 1996 to broaden the universe of available instruments and diversify the price risk. In developing countries where banks play an important role in mobilising domestic savings, FRNs suit the banks' balance sheet structure, particularly in a rising interest rate environment. For the issuer, FRNs are financing tools attracting longer maturities at short-term funding cost. FRNs are offered every month in five- and seven-year maturities at a variable coupon of 3-month Saudi Interbank Offered Rate (SIBOR) plus a spread.

Government debt securities are issued in book entry form in SAR 1 million denomination. For retail buyers, the minimum purchase is SAR 50,000. Holders can enter into a repo agreement with the debt manager (the Saudi Arabian Monetary Agency, or SAMA) for up to 75% of their gross holdings. The interbank repo market is expected to be operative shortly upon completion of relevant repo agreements between the banks. Domestic banks display GDB prices on their Reuters pages.

2. Debt management policy objectives and techniques

The main objectives of debt management are listed below.

[1] Vice-Governor and Investment Advisor respectively at the Saudi Arabian Monetary Agency.

Broadening the range and the distribution of government debt instruments

This objective deals with covering the government's gross borrowing requirements and ensuring its continued access to financial markets. Gross borrowing requirements may consist of financing a gap between expenditure and revenue in a given period and/or needs for refunding maturing debt. Saudi Arabia's borrowing requirements have remained confined to financing budget deficit and/or refunding maturing debt from domestic sources. There is a fair amount of diversity in debt instruments offered to the market in the form of T-bills, GDBs and FRNs. Debt management has not been used to support monetary policy, such as by issuing more debt to mop up excess liquidity. Nor has foreign currency borrowing been used to strengthen the country's foreign exchange reserves.

Effective management of selling operations

One important aspect of this complex question is that debt managers generally attempt to reconcile the following objectives:

- to realise quantitative borrowing targets; and
- to obtain the lowest possible issue cost under given circumstances.

Achieving these objectives may often imply that government debt operations should not disrupt the smooth functioning of financial markets. A relatively wide range of debt instruments and timing of issues are helpful in maintaining orderly market conditions and minimising borrowing costs. Saudi Arabia offers floating and fixed rate instruments with different maturities to satisfy investor preference in terms of product and maturity. The product composition has been instrumental in raising the required amount of funding from the captive sources in the domestic market. Government debt instruments are issued at relatively short intervals. Given sharp fluctuations in the level of subscription, SAMA chose to raise the issue size to accommodate sporadic oversubscriptions, but lately the issue amount has been left open, as this is effectively determined by the market. In the event of undersubscription or weak investor interest, there would be no devolution on SAMA.

Minimising borrowing cost

This objective is of special significance to countries where interest payments on outstanding debt have become an important item in the government's budget. In Saudi Arabia, attention has remained focused on raising the required funding from captive sources at coupons/yields set by the debt manager. The justification for price fixing was the concern that a small group of banks acting in concert could manipulate the market. An argument in favour of applying an auction technique is that the debt manager does not have to take a decision vis-à-vis the market on the issue yield. In the absence of an auction/tender system, it would be difficult to judge the appropriateness of the cost of borrowing, though the availability of fixed and floating rate instruments gives the issuer flexibility to use them over the interest rate cycle.

Borrowing costs can be reduced by applying "privileged circuits" either in the form of mandatory investment regulations or in the form of offering tax privileges on income from government securities. There could thus be short-term cost savings to the government but long-term efficiency losses for the economy as a whole (as part of the borrowing cost burden would be shifted to other borrowers). Saudi Arabia has preferred to stay away from mandatory direction of investment. In the absence of formal underwriting and distribution commitments by market-makers, the obvious saving to the issuer is the incentive fee but the hidden cost is an illiquid secondary market.

Maturity structure

This objective calls for avoidance of a heavy bunching of maturing debt, redemption payments and refunding operations in particular periods during the year. The longer the average life of debt, and the more balanced the distribution of maturity and amounts, the smaller the refunding needs in a particular year. Saudi Arabia has endeavoured to spread its debt across the curve by accommodating the longer maturity profile of autonomous government institutions in a bid to avoid the bunching effect and subsequent crowding for refunding.

Secondary market

The existence of efficient secondary markets for government securities facilitates the successful launching of new issues. Other objectives of debt management, such as smoothing bond price movements and minimising the impact of redemption payments, may also be facilitated if open market operations/interventions can be conducted in well functioning secondary markets. Saudi Arabia suffers from a weak secondary market. In our experience, the inefficiency of the secondary market is a reflection of a narrow investor base, a short-term investment culture and the absence of investment banks. The growth in Saudi Arabia's primary market size is not a reflection of a liquid secondary market but has to do with the availability of adequate captive sources of funds.

SAMA has so far addressed the "product" (the instrument design) by improving the issuance mechanism, such as tap issues to create size, a full maturity spectrum for duration management, fixed and floating coupons to diversify price risk, and the availability of a repo facility for day-to-day liquidity management. On the "distribution" side, much has to be done. This subject is currently being discussed with the banks, particularly the issue of primary dealership and incentives against their underwriting and distribution commitment. A detailed discussion on product distribution is given in section 4 below.

3. Interaction between debt markets and banks

Banks continue to have a unique place within the financial system. They operate with a wide variety of assets and liabilities. Recently, financial intermediation has undergone a profound transformation in developed markets due to changes in the global financial system. In developing countries, banks still play a preponderant role in financial intermediation.

A system in which capital markets are the principal means of corporate finance is very different from one in which loans or credits predominate. In well developed markets, high-quality borrowers often raise funds by approaching investors directly (disintermediating the banks). Where there is less institutional specialisation and a limited secondary market, as is the case in emerging debt markets, a loan-based system of corporate finance remains pronounced.

In Saudi Arabia, money market operations are confined to bank deposits, repos and foreign exchange swaps. Bank-guaranteed commercial paper, first issued in 2000, has yet to gain popularity with both investors and borrowers. Banks are now focusing on fee-generating business. As far as bank balance sheets are concerned, there was a major shift in the asset composition of Saudi banks during the 1990s. For instance, banks' aggregate loans accounted for 34% of total assets in June 2001, compared with 39% at end-1996; investments rose to 43% from 29% and interbank deposits declined to 12% from 23%. Almost 30% of banks' assets are in the form of government securities. It may be noted here that the banks are not coerced into investing in government debt instruments. While recognising the developmental role that banks can play in relation to the debt market, it is also important to note that greater involvement of commercial banks in the secondary market can expose them to risks which may not be prudent. It is for this reason that in many countries there is a strict separation of commercial banking functions from market-related activities.

Saudi banks tend to run unhedged interest rate exposures as their holdings of government securities are largely booked in investment accounts, which are marked to cost. Occasionally, the banks hedge their trading account portfolios using the US dollar futures market and/or fixed versus floating interest rate swaps, given the limitations of riyal hedging instruments. Since the underlying instrument and the hedge are in different currencies, this is not a perfect hedge. Indeed, the basis risk in such cross-hedgings could be substantial.

4. Liquidity of government bond markets: an ongoing challenge

Secondary markets play an important role in providing liquidity in times of a "cash crunch" by broadening the investor base. Efficient secondary markets are important for ensuring in the long run a successful marketing and distribution of government securities. A major condition for the development of secondary markets for government securities is a sufficient volume of outstanding government debt

and its wider distribution. A second major condition for secondary markets is the existence of private financial intermediaries prepared to quote two-way prices and deal in specified amounts in both rising and falling markets.

The distribution of government debt instruments is largely reactive in developing countries, and Saudi Arabia is no exception. In the Saudi context the main constraints on secondary market activity are:

- *Banks' market-making role*. Banks and selected financial institutions, which are regular investors in government bonds, generally prefer to "hold to maturity". This is understandable for financial institutions, which are end investors. But the banks, despite the diversity of their business, are still overwhelmed by the commercial banking philosophy – ie size of deposits, balance sheet growth and asset quality. These considerations result in a conflict of interest between retaining deposits and marketing GDBs at the expense of their deposit base. This pattern is quite in contrast with the investment banking approach. In the absence of monetary incentives, banks are reluctant to undertake investment banking functions such as underwriting and distribution commitments. SAMA is currently reviewing this issue. Logically speaking, it is essential that brokerage firms/security houses (whether subsidiaries of commercial banks or independent firms) be allowed to operate in the domestic market for dealing in GDBs and conducting investment banking business. With professional market-makers, the secondary market will be able to fulfil the role assigned to it.

- *Investor base*. Saudi Arabia has a narrow investor base. Apart from the banks and a few financial institutions, retail investors and corporations prefer short-term money market instruments. This attitude has to do with their short-termist investment culture and lack of awareness about the product risk/reward relationship.

  A few suggestions have been floated for improving liquidity in the secondary market. One is to market GDBs to retail investors through SAMA branches, with a provision to buy them back after expiration of a specified initial waiting period. This might encourage the banks to speed up their marketing efforts and over time take over from SAMA branches. But the banks, which are already complaining about autonomous government institutions' direct GDB dealings with SAMA (as it takes a major source of secondary market activity away from them), might consider this approach as a further encroachment on their market-making commitment. Retail distribution may be important from a public policy point of view, but its contribution to developing a secondary market may prove to be a non-event. In the grand scheme of things, it is imperative to focus on institutional flows, as these matter the most in creating liquidity in the secondary market.

  Another suggestion is to direct financial institutions to invest in GDBs. In some emerging economies, banks and other financial institutions are required to invest up to a quarter of their assets in government debt instruments. In the interest of free market workings, Saudi Arabia has refrained from imposing direction of investment on domestic financial institutions. There is, however, a substantial pool of money in the form of end of service benefits (ESBs) which remains untapped for the lack of regulatory framework. ESBs, which are deferred liabilities of employers, are not funded. Any social security reform should take into account the treatment of ESBs so that they are fully funded and the pool so created is available for long-term investment.

  Finally, the setup of mutual funds in Saudi Arabia largely caters to investor interest in foreign markets. Mutual funds, which are well suited to retail investors, should have a home bias in terms of design and marketing in order to mobilise domestic savings into the fledgling debt market. The ratio of GDB mutual funds to Government debt is a meagre 0.7%.

- *SAMA as market-maker*. In emerging markets, central banks also play a defined market-making role in government debt instruments. They undertake open market operations as a tool of public debt management, particularly in facilitating switch/swap programmes of banks and other financial institutions. SAMA has stayed away from this role to avoid being caught up in buying huge volumes of outstanding GDBs, particularly in a rising market when the banks would seek to realise profits. SAMA's reactive role has remained confined to meeting day-to-day liquidity needs of the banks through repos or draining excess liquidity through reverse repos. According to the memorandum of understanding (MOU) between SAMA and banks, SAMA would, at its discretion, swap issues with the banks provided the maturity differential did not exceed three months. Swap maturity mismatch restrictions and SAMA's discretion rendered the MOU largely ineffective in its application. SAMA may revisit its role

and revise its strategy in terms of open market operations, without hampering its monetary policy.

- *Monetary policy versus debt market.* In Saudi Arabia, monetary policy revolves around the stability of the dollar/riyal exchange rate. Exchange rate targeting necessitates tracking dollar interest rates closely regardless of the inflation differential (of about 1½%), which is supportive to the riyal. In a disinflationary environment, the investor focus remains on the shape of the yield curve rather than the level of interest rates. Lately, the steepness of the curve resulting from aggressive global monetary easing has enhanced the attraction of longer maturities. SAMA, as the central bank and debt manager, has a delicate balance to strike between the cost of borrowing to the issuer and its other roles. SAMA conducts government debt operations within a given overall financing task in such a way that undesirable liquidity effects are avoided. SAMA refrains from conducting monetary policy to support the government debt market, but this policy consideration should not be confused with open market operations in the context of public debt management.
- *Infrastructure*. Saudi Arabia has an efficient clearing and settlement infrastructure. Saudi Arabian Interbank Express is an advanced payment system based on real-time gross settlement. Shares are traded via an electronic trading system, called Tadawul, which provides a continuous, order-*driven* market. Bonds, which are currently traded via telephone, are expected to be included in the electronic trading system next year. Unlike the sophisticated technical infrastructure, the regulatory and operational framework is fragmented. Capital market laws are being finalised, and this should be a welcome development in terms of rendering credibility to the securities market in Saudi Arabia. With regard to the central issue of distribution, there is a pressing need to overhaul the existing market-making structure by introducing investment banking operations in Saudi Arabia and expanding SAMA's role in open market operations.

5. Concluding remarks

The Saudi Arabian government debt market shares the shortcomings of many emerging markets in terms of debt distribution and secondary market liquidity. During the last decade, SAMA and banks jointly worked to identify factors needing to be addressed. Initially, the focus was on broadening the range of instruments in terms of coupon characteristics and maturities, followed by creating a sizeable volume of outstanding debt in a single issue through "tap issues". Pricing of issues went through evolutionary changes to reflect the market dynamics. As it stands, the instrument design appears to have the features required for secondary market trading. However, the distribution conundrum stands in the way of secondary market liquidity. Obviously, the narrow investor base, poor publicity, the absence of investment banks and SAMA's passive role in open market operations have not been helpful to secondary market trading. Any discussion of corporate bonds at this juncture may be premature before the relevant concerns/constraints affecting government bonds are adequately addressed.

Debt market development in Singapore

Teo Swee Lian

1. Introduction

In 1997, the Monetary Authority of Singapore (MAS) embarked on a fundamental review of its policies in regulating and developing Singapore's financial sector. One component was the development of a liquid bond market. The Asian crisis showed that an overdependence on the banking system could exacerbate problems for borrowers. Having a deep and liquid bond market would offer borrowers the flexibility to diversify their sources of funding and provide them with a good alternative source to raising long-term capital for matching any long-term expenditure needs.

Moreover, many investors in financial assets in Singapore held short-term money market products, equities or property. The development of the bond market would make available to investors a wider choice of assets, of varying credit risks and maturities, to bridge this gap in the risk spectrum. Insurance companies would also have long-term assets to match long-term liabilities and would not need to resort to a heavy allocation into equities.

This paper gives an update on the bond market development efforts in Singapore, and discusses some of the issues and challenges the market faces going forward.

2. Initiatives to develop the Singapore dollar bond market

The measures taken since 1997 have focused on several key areas:

(i) building the Singapore Government Securities (SGS) yield curve to serve as a benchmark;

(ii) building a critical mass and diversity of issuers;

(iii) developing the depth and breadth of the investor base;

(iv) developing the talent pool with expertise in debt origination, trading and sales; and

(v) establishing the physical infrastructure and markets for hedging.

Measures taken to develop the SGS market

The following measures were taken:

- extending the benchmark yield curve, by issuing 10-year SGS in 1998, and 15-year in 2001;
- establishing a public calendar of issuance. There is a weekly issue of three-month T-bills, while one-, two-, five-, seven-, 10- and 15-year bonds are issued according to an annual calendar announced in September for the following year. The exact size of each T-bill and bond issue is made known one week before the auction;
- adopting an issuance programme with the aim of building large, liquid benchmarks, including
  - increasing the typical size of SGS issues to around S$2-3 billion per tranche,
  - reopening existing issues to enlarge the free float for trading,
  - buying back small-sized, off-the-run issues in order to channel liquidity into the larger benchmark bonds that MAS had started issuing,
- establishing a repo facility to support the primary dealers; and
- providing a pool of securities from which primary dealers could borrow to cover their short positions arising from market-making activities.

Having an efficient repo market is important for supporting secondary market activity and is a key element in a liquid bond market. A deep and liquid repo market provides market players with a means of financing positions, and enables them to take long/short positions such as buying one bond and selling another to take advantage of yield curve arbitrage opportunities. In addition, it also facilitates portfolio management. In markets where foreign players participate, the ability to execute repos is important, especially if they do not have access to the domestic deposit base. Otherwise funding would be through credit lines from the banking system, which are often not as efficient as collateralised funding in repo markets. MAS established a repo facility to support the market-making activities of the primary dealers. It has also made more active use of repo transactions in its money market operations. Furthermore, MAS has encouraged players to adopt best international practices and documentation standards.

As the SGS market is still developing, the presence of designated market-makers known as primary dealers (PDs) has been beneficial in ensuring an active secondary market. PDs in SGS are required to provide two-way quotes under all market conditions, and are obliged to underwrite SGS issued through primary auctions. In return, privileges are accorded so that it is attractive for banks to become PDs. For example, only PDs can participate directly in primary auctions, only PDs have access to the MAS repo facility, and MAS carries out its money market operations solely through the PDs.

The primary auction design is an important consideration in mitigating non-competitive behaviour at primary bond auctions. The key aspects of auction design in achieving this objective include: (a) the scope of private sector participation; (b) the role of competitive versus non-competitive bids;[1] (c) central bank participation; (d) the price determination and allocation mechanism for competitive bids; and (e) the transparency of the auction. In Singapore, SGS auctions are modelled on the "discriminatory price" format, rather than the "uniform price" format.[2] Allowing both competitive and non-competitive bidding at bond auctions has benefits. Non-competitive bidding may reduce the likelihood of collusive behaviour among the major players at the auction by ensuring that less sophisticated investors, who may not have current market information, are able to purchase a certain amount of securities at a current market yield. As a result, it helps achieve a broader investor base. However, the amount of securities allotted through non-competitive bidding must be controlled. If a large proportion of the bids are non-competitive, then the resultant price will be distorted as it only represents a very small proportion of market demand. In the SGS market, both competitive and non-competitive bidding is allowed, but only competitive bidding is permitted in T-bill auctions. MAS participates directly in SGS auctions in order to acquire securities for its money market operations and for its repo facility. To minimise the impact of MAS's involvement on prices, MAS participates in SGS bond auctions on a non-competitive basis.

The range of measures taken to develop the SGS market has been successful in establishing a more liquid benchmark yield curve. The increased size and liquidity of the SGS market have also resulted in its inclusion in JP Morgan's World Government Broad Index in June 2001, as well as in Lehman Brothers' Global Aggregate Index.

The outstanding volume of SGS has more than doubled since 1997. Total outstanding volume as at 2001 was S$ 53.6 billion compared to S$ 22 billion in 1997. In 2001, outstanding SGS stood at 39% of GDP.

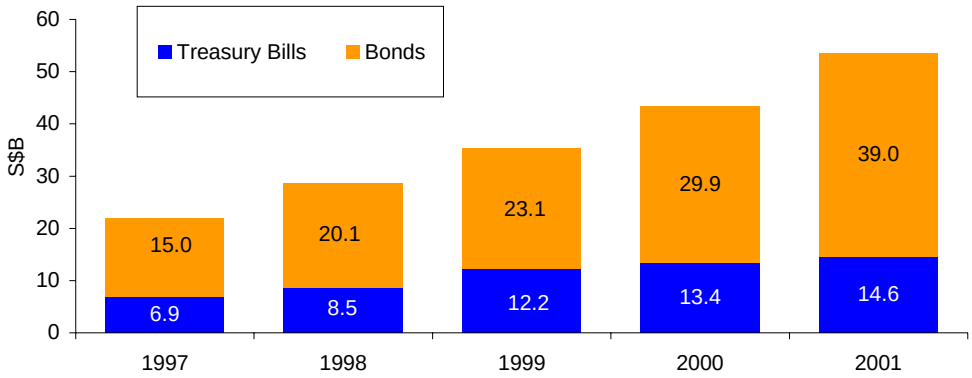
[1] A competitive bid is one where the applicant wants to be allocated securities only at the yield specified in her application. An applicant submitting a non-competitive bid is willing to be allotted securities at the average yield of all successful bidders.

[2] In a "discriminatory price" auction, successful bidders pay the price they bid, while in "uniform price" auctions all successful bidders pay the same price. See the paper by Mohanty in this volume.

Graph 1

Singapore government securities outstanding

In billions of Singapore dollars

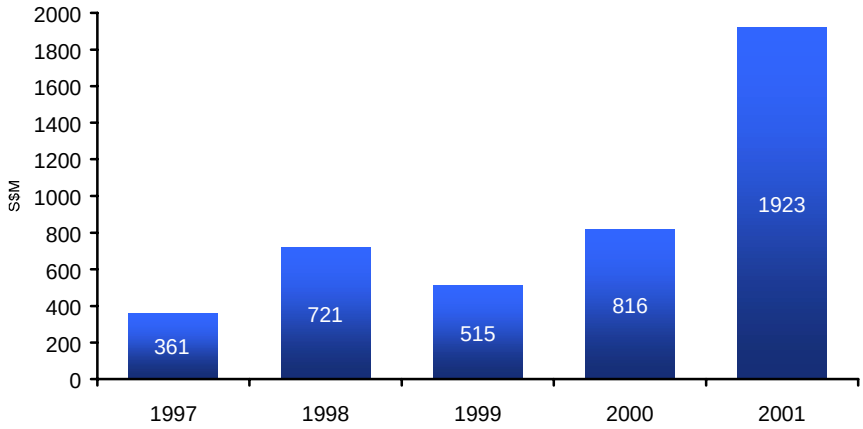


The average daily turnover in both the outright (Graph 2) and repo (Graph 3) markets has made significant progress with daily volumes of over S$ 1 billion in 2001.

Graph 2

Singapore government securities: average daily turnover

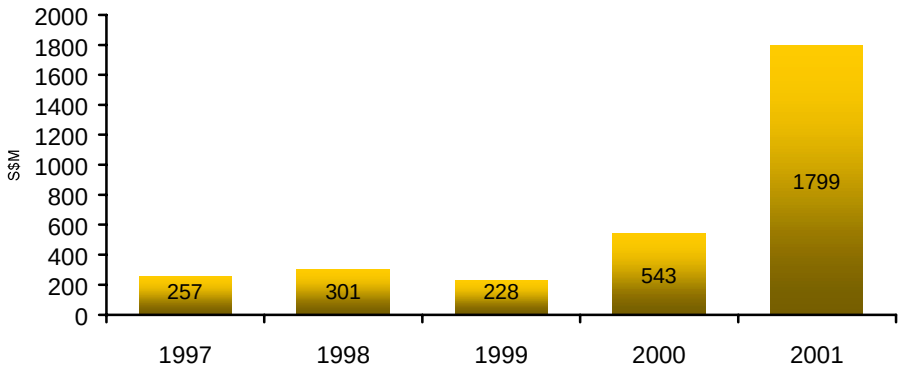
In millions of Singapore dollars



Graph 3

Repo market: average daily turnover

In millions of Singapore dollars



Building critical mass and diversity of issuers

A two-pronged approach has been adopted. First, the government encouraged the statutory boards to tap the debt capital markets for their funding needs. To date, three statutory boards[3] have issued bonds denominated in Singapore dollars and have raised about S$ 5.3 billion since October 1998. They are expected to continue to be significant issuers in the Singapore bond market.

Second, the policy of non-internationalisation of the Singapore dollar was liberalised in August 1998 to allow foreign entities to tap the Singapore dollar bond market. This was subject to the requirement that the domestic currency proceeds must be swapped or converted to a foreign currency if bought or used outside Singapore. A further liberalisation, allowing even unrated foreign entities to tap the market provided they sold the bonds only to sophisticated investors, was subsequently phased in. Since October 1998, there have been 75 issues totalling S$ 7.5 billion by foreign entities from the US, Europe and the Asia-Pacific region.

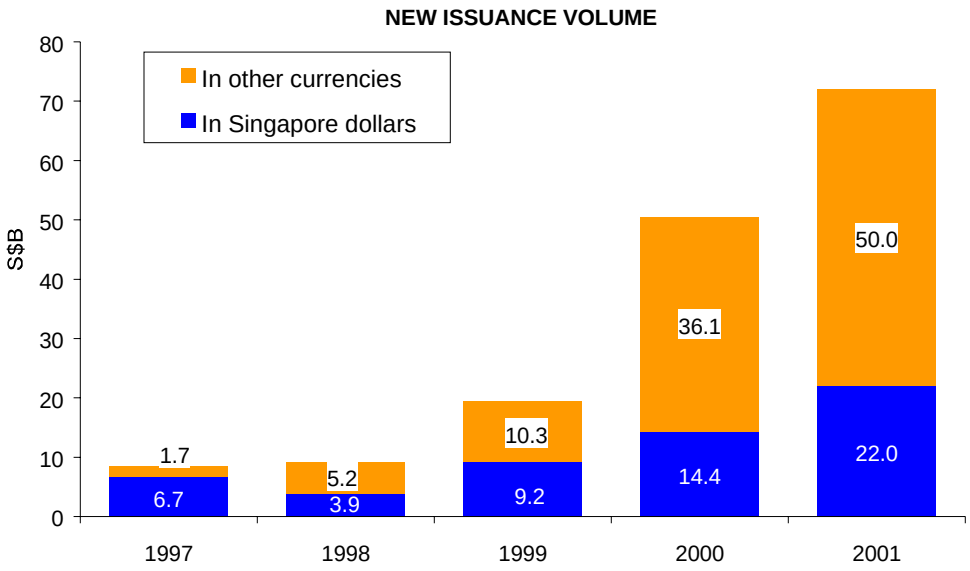
The total volume of S$ denominated and non-S$ denominated corporate debt continued to grow strongly in 2001 with total corporate bond issuance of S$ 80.8 billion. For debt denominated in Singapore dollars, issuance was across the maturity spectrum up to 15 years with structured paper comprising 47% of the total Singapore dollar debt issued. The market also saw the launch of several large Singapore dollar bond issues of around S$ 1 billion in 2001, compared to average issue sizes of S$ 20 million before 1998. For other debt, the bulk of the issuance was concentrated in short-term commercial paper.

[3] Jurong Town Corporation, Housing Development Board and Land Transport Authority.

Graph 4

Corporate debt market: new issuance

In billions of Singapore dollars

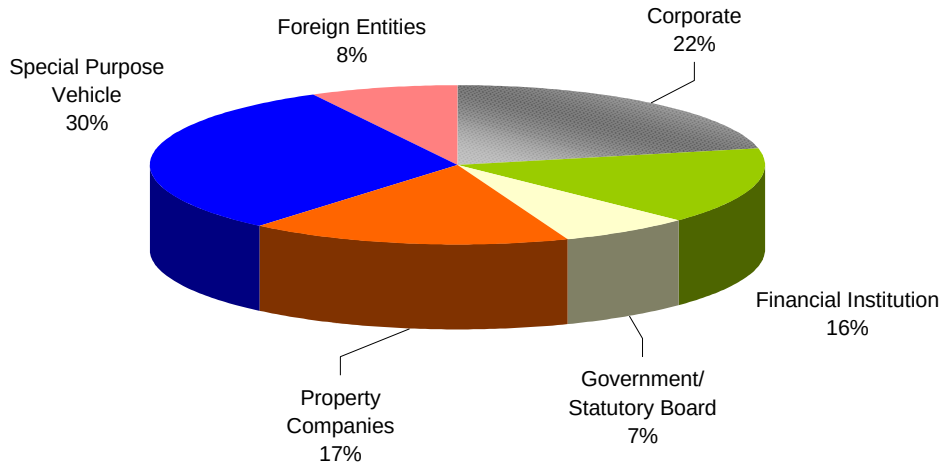


Singapore is now experiencing a greater diversity of issuers in the market. Prior to 1998 property companies dominated the local currency bond market. Now there are also issues by the engineering, manufacturing, food, logistics and transport industries.

Graph 5

Issuers in Singapore dollar bond market, 2000

As a percentage of all issuers



Broadening and deepening the investor base

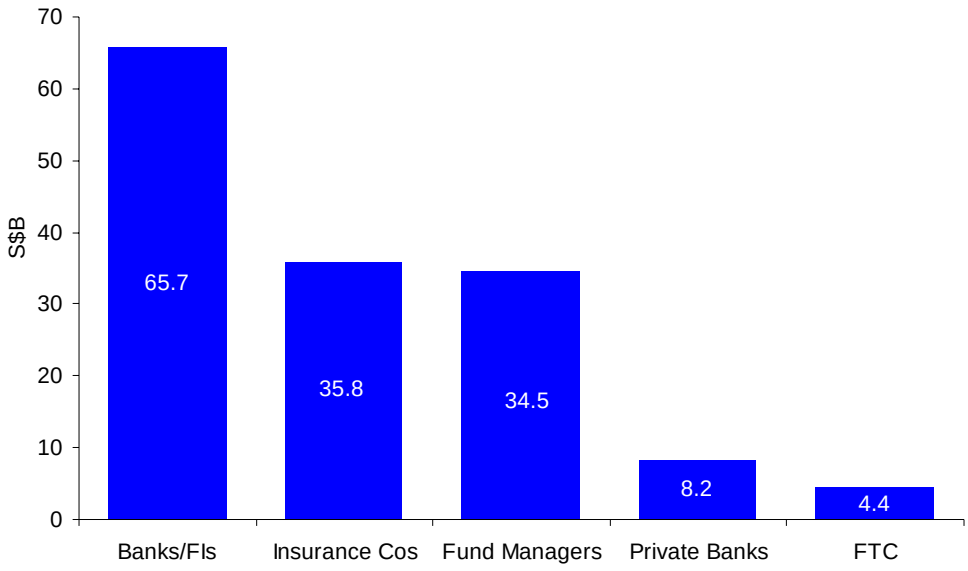
The investor base in Singapore for Singapore dollar-denominated bonds (including SGS) is largely institutional, and dominated by the banks and insurance companies. Fund managers are also fairly active although they only invest a minority of funds in these bonds. Ongoing initiatives are being taken to develop the funds management industry to increase the depth and breadth of the fixed income investor base in Singapore. The retail investor base is currently small. However, there is growing interest and demand, as evidenced by the oversubscription in the various tranches of the statutory board bonds offered to the public. The intermediaries have also been active in trying to raise the level of awareness and educate the public on bond investments, and organised a retail bond fair to meet this objective. They have also been reaching out to more non-resident investors.

Investments in S$ and non-S$ debt securities by investors resident in Singapore has grown by an estimated 32% in 2001 to S$ 144 billion. Insurance companies' fixed income investments as a percentage of the total investments also grew from 30% in 1999 to 41% in 2000, and stood at 49% as at September 2001.

Graph 6

Investments by resident financial institutions in debt securities (all currencies)

In billions of Singapore dollars



Developing the talent pool

In addition to the pool of issuers and investors, the presence of intermediaries is also crucial in structuring the transactions and providing secondary market support. Singapore has introduced a tax incentive scheme to improve capabilities in the arrangement, distribution and trading of bonds.

Establishing the infrastructure and markets for hedging

SGS transactions are cleared on a delivery-versus-payment (DvP) basis over the MAS Electronic Payment System and MAS's book-entry clearing system for SGS. For clearing Singapore dollar-denominated non-government bonds, an electronic book-entry DvP system was put in place in 1998 by the Central Depositary, a subsidiary of the Singapore Exchange.

To facilitate secondary market activity, wider participation has been encouraged and costs reduced through the removal of regulatory reserve requirements and a tax scheme. Furthermore, a five-year SGS bond futures contract was launched in June 2001.

3. Challenges facing debt market development

The challenges facing the further development of the debt market in Singapore include:

- *increasing market liquidity*

  Domestic corporate treasurers and fund managers, including insurance companies, need to be educated and encouraged to be more proactive in portfolio management and in using sophisticated risk management instruments.

  What is the best approach for Singapore to take to use technological developments to increase the transparency and liquidity of the market? For example, should the market move more quickly towards trading on e-bond platforms?

- *improving the depth and breadth of the investor base*

  There is the need to continue to educate domestic investors about investing in bonds, as opposed to other traditional investments such as property, equity and cash. There is also a need to raise the level of sophistication of the domestic institutional investors. In addition, Singapore wants to encourage non-resident investors to participate in the bond market.

Development of the Thai bond market

Akkharaphol Chabchitrchaidol and Orawan Permpoon[1]

1. Introduction

The rebuilding and strengthening of Thailand's financial sector in the aftermath of the 1997 economic and financial crisis brought to light weaknesses in the country's financial development. Prior to the financial crisis of 1997, the function of financial intermediation fell almost entirely on commercial banks. They mobilised funds mainly through deposits, which accounted for roughly 80% of domestic banking liabilities. At the same time, they held almost 70% of total financial sector assets, most of which were in the form of credits to the household and corporate sectors. Direct financing through the domestic bond market – through both government and corporate bonds – was relatively small and not well developed. Nine consecutive years of fiscal surplus between 1988 and 1996 provided no incentive for the government to issue regular and substantial amounts of government bonds. The resultant limited supply of government bonds inhibited the development of a risk-free benchmark for the market and private issuers to price their corporate bonds.

The crisis brought to the fore an imbalance in the structure and operation of Thai financial markets. In particular, with limited financing alternatives to bank loans, businesses in Thailand after the crisis faced a severe liquidity crunch as the banking sector curtailed its lending operations amid high non-performing loan ratios and a need to rebuild its capital. This intensified the economic slowdown, as the highly leveraged business sector was without the normal channel of funding.

In the aftermath of the crisis, the authorities in Thailand put a great deal of effort into redressing this imbalance in the financial system. Development of the domestic bond market was given a high priority, partly because of the necessity of funding the financial sector restructuring and partly as an alternative funding source to reduce reliance on bank intermediation. In addition to the efficiency gain expected from increased competition for funding, a more developed bond market would also provide the economy with a more balanced financial infrastructure, thereby diversifying the risk of intermediation across a large number of institutions and market players. The aim has been to achieve a better distribution between bank financing, equity financing through the stock market, and debt financing through the domestic bond market.

Graph 1 shows that although bank loans still dominate the bulk of financing in the country, the share of bonds used for financing has increased steadily.

2. The development of bond markets in Thailand

The development of a government bond market was seen as a crucial step in providing the infrastructure for the development of the overall bond market in terms of volume, a risk-free benchmark price signal and market liquidity for active secondary market trading.

The Thai bond market is dominated by issues of public debt securities, which account for more than two thirds of the total number of bonds in the market. While the corporate bond market has grown fourfold since the crisis, its development is still being handicapped by the lack of quality issuers. In total, the fixed income market in Thailand grew from 7.6% of GDP in 1992 to about 35% in 2000. The outstanding value of the total bond market increased from THB 547 billion ($22 billion) in 1996 to THB 1,882 billion ($47 billion) at the end of 2001. Trading volume in the secondary market rose from a daily

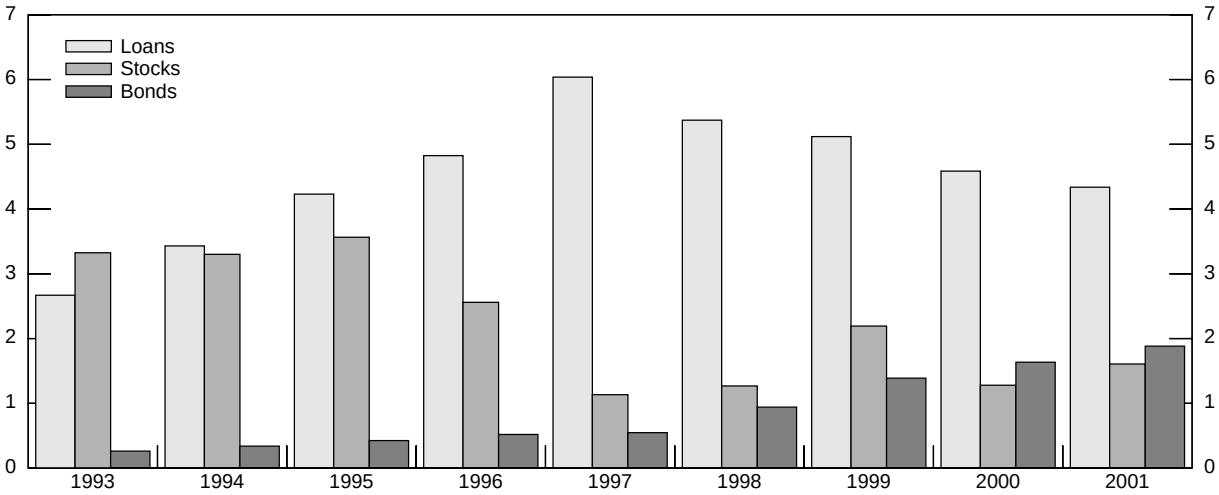
[1] Economist in International Economics Department and Analyst in Financial Markets Operations Group respectively, in the Bank of Thailand.

average of THB 822 million ($32 million) in 1996 to THB 4,485 million ($112 million) in 2001. Trading in corporate and government issues reached record levels in early 2001, and turnover now averages around THB 130 billion ($2.9 billion) a month.

Graph 1

Sources of financing

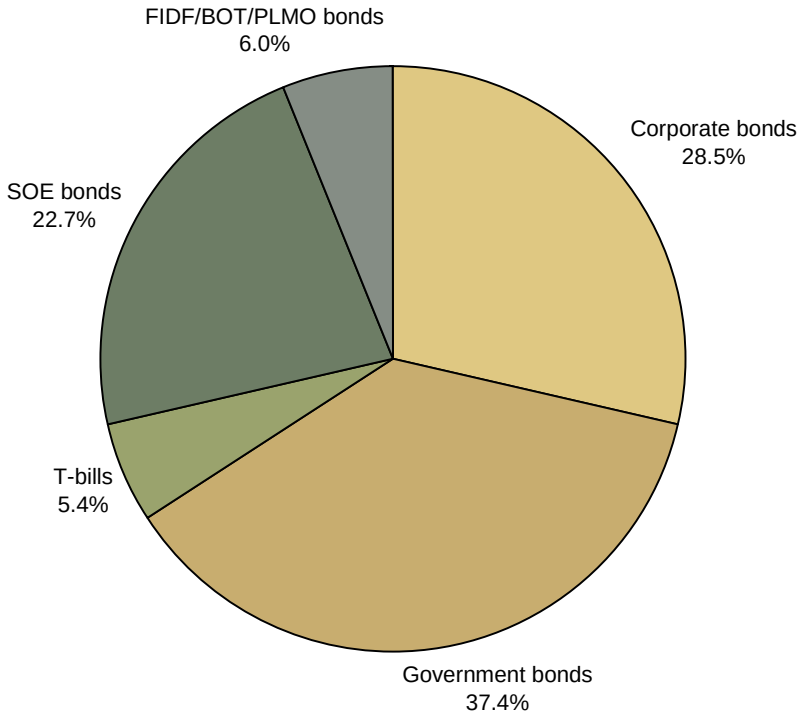
In trillions of Thai baht



Source: Thai Bond Dealing Centre (TBDC).

Graph 2

Thai bond market profile



Source: Bank of Thailand.

There are four major types of public debt securities;

- Treasury bills are short-term debt instruments with a maturity of less than one year and are sold on a discount basis.
- Government bonds are medium to long-term debt instruments issued by the Ministry of Finance (MoF). There are three types; investment bonds (IB), loan bonds (LB) and savings bonds (SB). While IBs have not been issued since 1991 and have now all fallen due, LBs capture the majority of the market as they are issued for financing the budget deficit, as well as to fund financial sector restructuring. SBs are issued to provide households and non-profit organisations with an alternative source of saving.
- Bank of Thailand (BOT) bonds, Financial Institutions Development Fund (FIDF) bonds and Property Loan Management Organisation (PLMO) bonds are issued by the BOT, the FIDF and the PLMO respectively. The BOT has not issued bonds since 1997 and the last of these matured in July 2001.
- State enterprise bonds are medium to long-term debt instruments issued by state-owned enterprises. Bonds of this type are generally guaranteed by the MoF, and so benefit from lower coupon rates.

Table 1

Bond market profile
year-end

	1997	1999	2000	2001
Government bonds	14	587	659	709
FIDF[1] bonds (government-guaranteed)				112
State enterprise bonds: of which	294			
Government-guaranteed		*309*	*345*	357
Not guaranteed		*47*	*64*	*59*
Treasury bills		25	62	110
Corporate bonds	134	402	501	538
Total	442	1,370	1,631	1,882

[1] Financial Institutions Development Fund.

Source: Bank of Thailand.

3. The government bond market

Since the onset of the crisis, Thailand's domestic bond market has grown progressively, dominated largely by the government bond market. With the government's need to borrow in order to meet the cost of financial sector restructuring, there was a sharp surge in the supply of government bonds. The large volume of issuance provided an opportunity to create a regular supply of government bonds. As of December 2001, total outstanding government bonds stood at THB 709 billion ($16 billion). Daily turnover rose from an average of THB 1.4 billion ($37 million) per day in 1999 to an average of THB 3.0 billion ($75 million) in 2001. On active trading days, volume has hit up to THB 10 billion ($249 million).

A number of measures have been taken to develop the government bond market. Currently, advance issuance schedules are made public to ensure certainty of funding for the government and efficient fund management. Secondly, securities are being issued in regular amounts and across maturities ranging from one to 20 years. Third, a system of primary dealers has also been set up to support government bond auctions and bond trading activities (for both private and public securities) and facilitate the BOT's own conduct of open market operations. There have been parallel efforts to

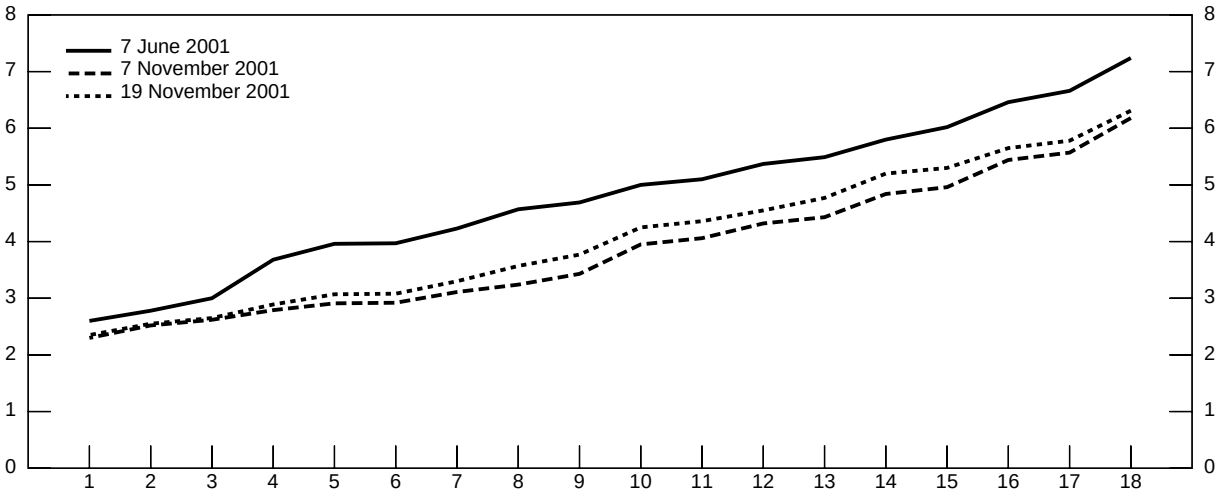
develop the market for T-bills through a regular auction of one-, three- and six-month bills. The T-bill yield curve, in turn, provides the benchmark for the short-term money market.

With the systematic issuance of government bonds, together with increased activity in the secondary market, the government bond yield curve is now available on a daily basis and provides an important indicator of financial market conditions as well as market sentiment.

Graph 3

Government bond yield curve

In per cent per annum



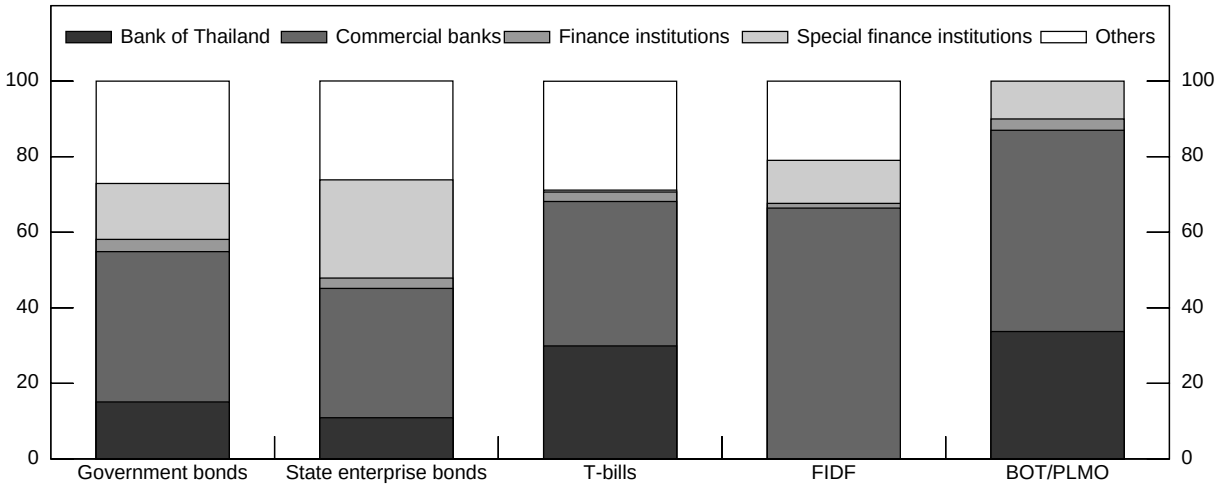
Source: Bank of Thailand

The BOT acts as fiscal agent and registrar of government securities and collects and disseminates data on holders and trading volume. Commercial banks are the largest holders of government bonds, given their inclination towards caution in extending credit to the private sector (Graph 4).

Graph 4

Profile of government bondholders

As a percentage of all bondholders



Note: Finance institutions include finance companies, finance and security companies, credit foncier companies and security companies. Special financial institutions include The Government Savings Bank, Bank for Agriculture and Agricultural Cooperatives, Government Housing Bank, Export-Import Bank of Thailand and the Industrial Finance Corporation of Thailand.

Source: Bank of Thailand.

4. The corporate bond market

Following the enactment of the Securities and Exchange Act in 1992, which has streamlined criteria for the issuance of corporate bonds, the corporate sector gradually began to issue bonds. The amount of corporate debt securities rose gradually, picking up speed in 1999-2000. This came about as a low interest rate environment encouraged Thai corporations to source funds directly from the capital market, while banks all but ceased lending as they sought to rebuild capital and restructure their NPLs.

The development of the corporate bond market, however, faces a number of impediments. There are problems arising from supply and demand conditions as well as market liquidity and volatility. On the supply side, there was a limited supply of quality corporate issuers with a financial standing that was strong enough to meet the rigorous public disclosure requirements and external party ratings. This resulted in a higher all-in cost of funding through bond issuance relative to bank lending. In addition, in the wake of the crisis, the credit quality of most firms has been greatly impaired. This meant that there were a limited number of firms qualified to issue bonds, especially in the large amounts that were common with bond issues. This problem was further compounded by the fact that banks, which derived a large part of their profits from lending, were reluctant to underwrite issues. As a result, there have only been a limited number of issuer names, with the telecommunications and property sectors being the more common issuers.

On the demand side, there was limited interest from mutual funds and an inadequate institutional investor base. While the former was due to the lack of creditworthiness of the mutual funds, the latter resulted partly from the conservative nature of regulations governing the investment polices of institutional investors, as well as the preference for shorter-term investment given the perceived uncertainty about the economy. Investors may also have been concerned over the lack of a follow-up mechanism or effective monitoring of bond issuers after the initial public offering, especially with regards to the possible misuse of proceeds. This in turn made investment in corporate bonds less attractive.

The third problem was the lack of supporting facilities necessary for promoting an active secondary market for corporate bonds. Initiatives to develop the market further include a corporate bond yield curve as well as the Bangkok Inter-Bank Offered Rate, both of which could serve as a reference for floating rate securities and derivatives. There was also an underdeveloped market for risk and liquidity management instruments – including the lack of a private repurchase market – due in part to a non-neutral tax treatment, outdated accounting practices and regulations that limited market participation. Reliance on over-the-counter (OTC) rather than electronic trading as well as an ineffective distribution of real-time market information add to the cost of information search. Altogether, this meant that there was a lack of liquidity in the secondary market, as well as of any active two-way price quotation.

Outstanding corporate bonds grew from THB 5.1 billion ($201 million) in 1991 to THB 538 billion ($13 billion) in 2001. Daily trading volume of corporate securities rose from THB 0.13 billion ($3.5 million) in 1999 to THB 0.38 billion ($9.3 million) in 2001.

The corporate sector has issued a number of different types of bonds, which can be classified by features such as redemption and interest payments. They include straight coupon bonds, convertible bonds, amortising bonds and floating rate notes (FRNs).[2]

In an attempt to increase the variety of bonds available in the Thai bond market, the BOT has proposed that the Public Debt Management Office of the MoF issue FRNs. This is intended to provide a greater variety of instruments for investors, thereby helping to widen the investor base. Not only are FRNs expected to reduce investors' interest rate risk as the coupon is indexed to an interest rate benchmark, they are also expected to help reduce the cost of funding for the MoF compared to T-bills. In addition, this should show the MoF's commitment to a regular auction calendar as well as ensure a regular future supply of T-bills if the yield on the latter is to be used as the reference rate for FRNs. This should help contribute to building a solid framework for the further development of debt markets.

[2] FRNs are debt instruments which pay interest based on a reference rate, usually a short-term interest rate in the money market.

5. The primary market

Significant progress has been made in the development of the primary market for government debt in the last two years. The MoF, with assistance from the BOT, has established a regular programme for government bond and treasury bill issuance and an issuance calendar for market participants, which can be accessed through the websites of the BOT (www.bot.or.th) and the MoF (www.mof.go.th). While an advance calendar has been issued for government bonds and treasury bills, no formal schedule is yet available for state enterprise bonds. The aim is, by announcing as far ahead as possible and committing as closely as possible to the issuance calendar, to enhance the continuity, predictability, and transparency of bond issuance. Another crucial step in ensuring the successful development of the Thai bond market will be the development of a legal framework and the enactment of supportive legislation, such as the Debt Management Law, which will enhance the flexibility of public debt management.

In addition, the authorities are in the process of developing both savings bonds for retail investors and new debt instruments such as strip bonds, floating rate notes, index linked bonds and zero-coupon bonds to meet the demands of market participants.

Auction procedures

The American auction procedure is used for government bonds, T-bills, and FIDF bonds and is open to dealers as well as end investors in the primary market. It is a system that ensures the widest participation by the dealer community under a competitive bidding process. Government bonds, T-bills and FIDF bonds are auctioned by the BOT.

State enterprise bonds are auctioned using an underwriting procedure, whereby entire issues are awarded to bidders (underwriters) who offer the lowest cost of funding. The auctions are held by the Public Debt Management Office (PDMO).[3] The authorities are looking to improve the auction method by allowing large state-owned enterprises to be auctioned off to many buyers. In addition, all future auctions are to be centralised at the BOT.

Issuance of corporate bonds can be made through a public offering or a private placement. For publicly offered issues, the issuer must meet the criteria set by the Securities and Exchange Commission (SEC) and obtain its approval prior to launching an issue. For privately placed issues – offered to no more than 35 investors or to the 17 types of institutional investors as specified by the SEC – placement is much simpler. Since April 2000, both types of issues are required to be credit-rated, with an exemption granted for issuers with an offer amount not exceeding THB 100 million and with transfer limits of 10 holders.

Recognising the inefficiency of physically handling transactions, the BOT is in the process of developing an online bidding process. The introduction of an electronic system for the submission of bids, instead of the present system whereby dealers are required to physically submit their bids on paper, is expected to reduce turnaround time for dealers and traders, and also support trading in the secondary market.

Establishment of a primary dealer system

The development of a primary dealer system is aimed at supporting the auction process in the primary market as well as enhancing liquidity in the secondary market and facilitating the conduct of open market operations. The BOT appointed eight banks and one securities firm, which are active market participants, as primary dealers in June 2000. These institutions are required to act as market makers, providing daily two-way indicative quotations for outstanding government bond issues.

Institutions wishing to qualify for selection as primary dealers for outright transactions have to meet a number of requirements, as announced by the BOT in December 2001. They are required to

[3] The PDMO was established in September 1999 in order to improve the efficiency of the country's debt management. Its objective is to centralise bond issuance so that the auction calendar of government and state enterprise bonds can be consolidated and set in advance.

participate frequently in auctions of government bonds and maintain the specified amount of government bonds allocated for investment in the primary market. In the secondary market, they are required to be able to provide a two-way price quotation for benchmark securities as well as a firm price in ordinary circumstances. In addition, they are required to maintain an appropriate level of trading in the secondary market for each maturity as required by the authorities. These institutions will act as advisors to the MoF in planning the issue of further government bonds, and will act as counterparty for any transactions by the BOT, in addition to acting as a contact with the central bank in developing the bond market.

A different set of criteria have been published for primary dealers for bilateral repo transactions. These primary dealers are required to act as intermediaries in transactions between the BOT and other market agents and as counterparty to the BOT in its bilateral repo transactions, which are to be used for open market operations.

6. The secondary market

A large primary issue of government bonds in itself does not mean that a market is developed. A deep and liquid market requires active secondary trading so that bondholders need not be concerned about incurring any losses or penalties should they wish to liquidate their bonds. An active secondary market is an integral part of the price discovery process where neither issuers nor borrowers will be disadvantaged by paying too high a price for capital, and can be confident of a fair market rate should they wish to exit the market. Among the important prerequisites for active secondary trading are the availability of intermediaries, hedging tools and a broad-based investor pool, as well as an efficient clearing and settlement system.

Within the secondary market, the authorities have tried to enhance liquidity and trading through the development of a primary dealer system (as mentioned above), whose institutions are required to act as market-makers and provide daily price quotations. At present, both indicative and executed price quotations are available on a daily basis for over 300 issues of government bonds, treasury bills, state enterprise bonds, and investment grade corporate bonds at the Thai Bond Dealing Centre's website (www.thaibdc.or.th). These primary dealers will be required to quote firm bids once a number of hedging tools are available to provide greater flexibility and protection. These tools include interest rate swaps as well as tools that will allow the short sale of bonds and the undertaking of repurchase operations and securities borrowing and lending.[4]

The role of the Bank of Thailand in developing the secondary market

In January 2000, the BOT carried out initial outright transactions with its counterparties in order to adjust its own portfolio holding of government bonds and to kick-start secondary trading. This had the effect of boosting the secondary market; the average daily turnover progressively rose from around THB 1.4 billion per day to over THB 3 billion per day. On 27 December 2000, the BOT started bilateral repurchase operations with its primary dealers in parallel with the current BOT-operated repo market. Even though the main objective of bilateral repurchases is the implementation of monetary policy, it is also expected to provide liquidity in support of secondary market trading. In addition, with the cooperation of the Thai Bond Dealers' Centre (TBDC) and its primary dealers, an indicative benchmark yield curve for risk-free government bonds has been published since September 1999. On 7 November 2000, the TBDC began to publish a matrix for government-guaranteed state enterprise bonds, which shows the daily spread for each state-enterprise group over government bonds with the same maturity.

[4] The BOT has allowed commercial banks to undertake securities borrowing and lending as principals, as well as allowing short sales, since September 2000. Previously, securities borrowing and lending had been permitted with the banks as agents since June 1999.

7. Market infrastructure

Regulatory environment

The BOT supervises the operation of banking and financial businesses while the SEC supervises the primary and secondary markets for securities. The issuance of securities is governed by the Securities and Exchange Act 1992. In November 1994, the "Bond Dealers' Club" was set up to act as the secondary market for debt securities. It was upgraded to the TBDC in April 1998 after it was granted a "bond exchange" licence from the SEC. The TBDC's goals are to provide an environment for fair and secure trading, to monitor trade and to disseminate information on the secondary bond market. The TBDC also functions as a self-regulatory organisation and has implemented a number of standards and conventions for bond trading.

Other developments

The BOT, in collaboration with various government agencies such as the SEC and the MoF, has been working to establish a market infrastructure that will be most conducive to the development of a bond market. This includes setting up a clearing and settlement system as well as the promotion of a private repurchase market.

An efficient clearing and settlement system for securities is absolutely essential to the active execution of trade at front offices. At present, the BOT is responsible for the settlement of public debt securities, as it acts as both depository and registrar. The majority of government bonds are issued in bearer form and are settled by physical delivery at the BOT. Corporate bonds are cleared and settled at the Thailand Securities Depository, and are transferred on a book entry basis. With the aim of reducing settlement risk, the BOT has developed the delivery versus payment (DvP) system, also known as BAHTNET II, which commenced operations on 21 December 2001. Market participants should benefit greatly from BAHTNET II as it reduces interbank settlement risk, improves convenience and service and allows the integration of future services and new financial instruments.

The development of a private repurchase market is also an important step in improving market infrastructure. If bond prices are transparent and reliable, the repurchase market provides a link between collateral and money markets. In the present repo market, the BOT acts as a matchmaker for lenders and borrowers. Because all transactions are made with the BOT, however, the market is distorted as credit risks of counterparties are not reflected in the interest rate charged, but reflect the risk of the central bank. Having realised the problems inherent with having the central bank as a central counterparty, the BOT is currently concluding development of the private repo market. Aside from providing tools for market participants to hedge their positions and manage liquidity,[5] a private repo market will also better reflect the borrowing needs and credit conditions of market participants. This will enable the BOT gradually to phase out the current BOT-run repo market and change the role of this window to being purely for monetary operations to absorb or inject market liquidity.

Remaining work on this issue will deal with the interpretation of rules and regulations of other institutional investors such as the Government Pension Fund or specialised government-owned financial institutions which have a large inventory of bonds, and whether they can actively participate in repo transactions. With regard to tax issues, the Revenue Department has agreed to abolish capital gains tax on repo transactions as of 10 April 2000, as well as the special business tax on the capital gains of the repo borrower and stamp duty on the transfer of securities.

Another important initiative, which can help provide greater stability to the market, is the broadening of both the issuer and the investor base. With regard to the former, Thailand's corporate issuers cover the entire spectrum of industries. With institutional investors, the presence of a larger variety of market actors such as fund managers, insurance companies, and other end-users will help eliminate the one-

[5] For example, if a dealer or mutual fund is subject to aggressive redemptions and wants cash, it need not liquidate its bond holdings but may instead repo out the bonds for cash, thus helping to preserve the value of its portfolio and curb market volatility. On the other hand, the party holding a large portfolio of bonds can also use those assets to enhance returns by selling them with an agreement to buy them back later.

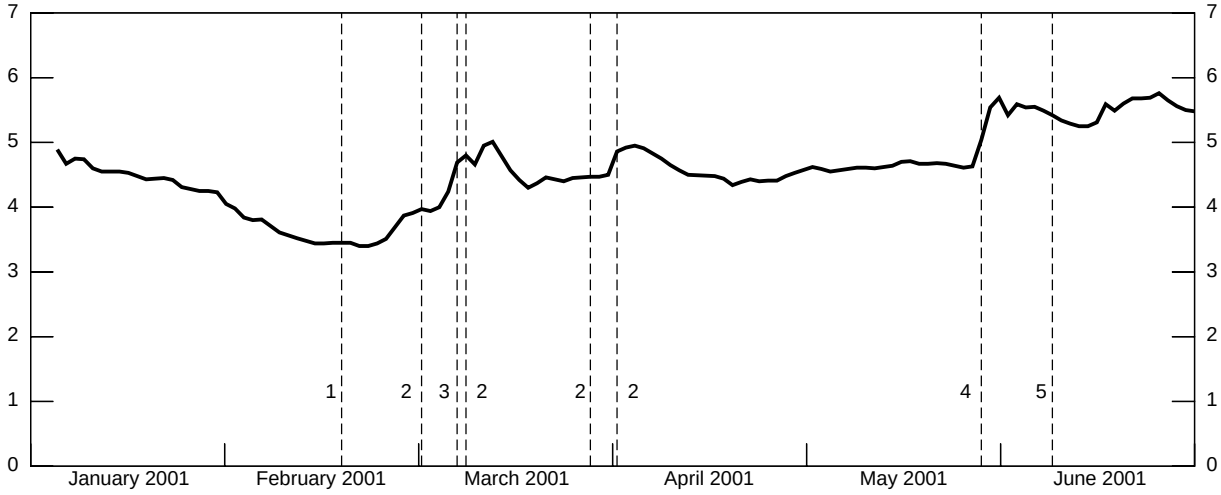
way direction of the market. It is worth noting that retail investors have begun to participate in fixed income security markets. In a recent $190 million corporate-bond issue by Advance Info Services, Thailand's largest wireless telecommunications company, retail investors purchased more than 60% of the securities issued. However, a number of problems still exist. For one thing, regulatory authority remains unclear; the BOT, MoF, TBDC and SEC share responsibility for regulation and supervision. This requires cooperation from all sides to provide a regulatory environment which will enable the institutions under their supervision to participate actively in the fixed-income market. This also includes pushing for equality of tax treatment between private repurchase transactions (which are currently taxed on a gross basis) and other money market transactions (such as swaps, which are taxed on a net basis).

Efforts to streamline regulation

At present, there are three types of income subject to taxation: interest, discount (a spread between par and a lower offer price) and capital gains. Tax rates vary according to type of investor and income. For example, non-resident institutional investors are subject to a 15% withholding tax on interest, discount and capital gains income. These rates may be reduced to 10% for non-residents from double tax treaty countries. However, by making interest income and capital gains from local bond mutual funds tax-exempt, the government has been able to stimulate demand from retail investors. At present, there are more than 80 fixed income mutual funds in Thailand that invest exclusively in local bonds. Together they have a total net asset value of THB 80 billion ($1.8 billion), up from THB 20 billion in early 1998.

Graph 5
Long bond yield movement

Government bond maturing in December 2008



[1] Heavy demand for long-term issues leads to aggressive bidding. [2] Volatile market conditions make investors nervous. Government and FIDF bond auctions are cancelled or not fully subscribed due to high yield bids. [3] Comment from the authorities that interest rates have reached bottom. Yields fluctuate by as much as 80 bps daily. [4] BOT governor Chatu Mongkol Sonakul removed on 29 May 2001. [5] BOT announces an increase in the policy rate by 100 bps from 1.5% to 2.5% on 8 June 2001.

Source: TBDC.

Work is also continuing on the rationalisation of remaining tax obstacles that hinder the development of private repurchase transactions and term lending in the money market. This includes the Special Business Tax, which is imposed on money market transactions on a gross basis. Other changes to the regulatory environment include streamlining accounting practices to ensure equal treatment for private

repurchase transactions and other money market transactions,[6] as well as continuing to rationalise regulations concerning securitisation, credit guarantees and derivatives. This includes relaxation of policies governing the use of hedging instruments – such as interest rate swaps – so that investors can reduce their risk. Mutual funds at the moment, for example, are prohibited from pledging their assets and therefore cannot enter into contracts for certain derivatives transactions.

The Thai bond market has come a long way in its development since the crisis. Nevertheless, more needs to be done. A number of events – including market volatility – which affected the market in 2001 reflected the rudimentary stage of the market, which still has to build up resilience and strength. Taking a 10-year government bond, we are able to see the volatility of its yield movements over a six-month period. For instance, the large demand for long-term issues led to aggressive bidding by market participants, bringing the yield curve to an all-time low in February 2001. Subsequently, with an influx of a large volume of state enterprise bonds, markets were confronted with shocks leading to large fluctuations in price and yield. The lack of depth of the market is also reflected in its sensitivity to comments from the authorities.

8. Conclusion and implications for monetary policy

In addition to creating a market and instruments to fund the government deficit and helping to develop capital and financial markets, the BOT has also benefited from the development of bond markets, which provided it with instruments for open market operations and increased the effectiveness of bond portfolio management. Like most central banks, the BOT previously relied on direct monetary instruments – reserve requirements, interest rate ceilings, and credit controls – as well as sectoral credit allocation. The development of bond markets has allowed the BOT to move away from direct instruments towards a greater use of market-based instruments, namely through open market operations. As the capital market becomes deeper and more liquid, the development of a repo market will facilitate the trend of monetary policy towards the use of indirect instruments.

Government securities are important assets as they can also be used by the central bank in market operations to manage the amount of liquidity in the financial system, and as collateral to support the functioning of payment and settlement systems. In market transactions, central banks prefer to use government securities as they are the most liquid and have minimal credit risk. Liquidity is important as central banks need to be able to conduct large transactions without distorting prevailing market prices in order to implement monetary policy efficiently, manage their balance sheets and, when required, supply credit to financial institutions in their role as lender of last resort.

The bond market has also been useful in strengthening the signalling effect of monetary policy, thereby enhancing the credibility of monetary policy operations. As bond yields typically respond much more rapidly to changes in the policy rate, or even to market sentiment or an assessment of impending change, this has provided the BOT with another vehicle for assessing the impact of monetary policy which is more sensitive, timely and clearer than when traditional market intermediation was dependent on bank financing. In addition, with the development of a domestic bond market, the authorities need to be concerned with and monitor the balance sheet effect of monetary policy as bonds constitute a growing portion of the asset holding of banks, mutual funds, insurance companies and other institutional investors who are subject to mark-to-market rules.

The interest rate channel of monetary policy transmission is also likely to become more effective with a more developed bond market. When the banking sector is impaired, as was the case in Thailand after the 1997 crisis, a change in the policy interest rate can still have some effect through the change in behaviour and issuing costs for corporate bonds. With the use of bilateral repurchase transactions, the central bank is able to support monetary operations under an inflation targeting framework by imposing an initial margin as well as marking collateral to market. At the same time, with more financing alternatives, the corporate sector will continue to have access to funds notwithstanding the problems in the banking sector.

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[6] For example, swaps are off balance sheet items and do not count as part of the liability base on which the FIDF fee (a fee for guarantee of the liabilities of financial institutions) is charged.

The Colombian government bond market

José Darío Uribe and Juan Camilo Gutiérrez[1]

1. Introduction

This document describes the recent development of the Colombian public bond market and the role played by the central bank, Banco de la República (BR). Section 2 shows the aggregate size of the Colombian bond market and its main characteristics: the issuers, the instruments and the exchange, over-the-counter and interbank markets. Section 3 examines public debt in greater detail. The last section underlines how BR has contributed to the development of the Colombian market.

2. Colombian capital markets

At end-2000 the Colombian capital markets, measured as the sum of total fixed income and equity securities traded on exchanges or on the over-the-counter markets, represented 212% of GDP. The trading is not evenly distributed; while the value of transactions in equities was only equivalent to 2% of GDP, the value of transactions of fixed income securities was equivalent to 210%. Of the total fixed-income transactions (mostly trading and repos), those conducted over-the-counter were equivalent to 173% of GDP while those taking place on exchanges were equivalent to 37%.

Table 1

Securities listed in the National Securities and Intermediaries Register

(number of securities)

	1990–94 average	**1995–99 average**	**2000**	**2001**[1]
Equities	267	232	161	163
Securitisation	29	66	70	70
Ordinary bonds	68	72	65	67
Local government bonds	24	34	39	38
Other bonds	8	11	15	17
Convertible bonds	13	12	10	7
Commercial papers	5	4	3	4
External government bonds	1	0	0	0
Total	415	431	363	366

[1] June 2001.

Source: Superintendencia de Valores

[1] The authors, respectively Deputy Governor and Head of the Operations and Market Development Department, thank Carolina Gómez, Ivonne Martinez and Silvia Juliana Mera for their assistance. All views expressed are those of the authors and not necessarily shared by the central bank.

According to the National Securities and Intermediaries Register, in June 2001 the main issuers of securities were the financial sector (26% of the total number of issuers), mortgage-backed funds (19%), the industrial sector (15%) and government agencies (10%).

In June 2001 these issuers had 366 different securities listed. The most common type of listed securities were stocks (of which there were 163), but their number has fallen 39% since 1997. In the same period the number of mortgage-backed securities has grown by 31%.

Table 2

Issuers on the National Securities and Intermediaries Register, by economic sector

(as a % of the total number of issuers)

	1990–94 average	**1995–99 average**	**2000**	**2001**[1]
Real sector				
Industrial sector	33	19	15	15
Farming and cattle breeding	9	7	6	6
Electricity, gas and water	2	4	6	5
Health services	0	2	2	2
Commerce	7	2	2	2
Construction	2	2	1	1
Mining	1	1	1	1
Transportation	1	2	1	1
Tourism	2	1	0	0
Education	0	1	0	0
Financial sector				
Financial corporations	30	34	27	26
Mortgage-backed funds	1	13	19	19
Entities supervised by SV	0	1	2	2
Market indices contracts	0	0	1	1
Government agencies	3	5	8	10
Other				
Other non-financial services	8	6	7	7
Cooperative sector	0	1	1	0
Total	100	100	100	100

[1] June 2001.

Source: Superintendencia de Valores.

2.1 Securities exchange

Table 3 summarises the value of securities traded on the Colombian exchanges during the previous decade. While the nominal value of securities traded grew fivefold, the total volume traded on exchanges grew eightfold. Since Law 51 of 1990 authorised BR to carry out its monetary policy with government bonds and the elimination of the Certificados de Cambio, BR's securities have moved from having the largest trading volume to not being traded at all more recently. While certificates of deposit (CDs) were heavily traded in the middle of the decade, they have been replaced recently by government bonds, specifically Class B Treasury Bonds (TES B).

Table 3

Value traded on exchanges

(billions of pesos)

	1990–94 average	**1995–99 average**	**2000**
Equities	1	3	3
CDs	2	12	12
Private bonds	0	7	4
Central bank[1]	2	1	0
TES	1	9	35
Other[2]	2	9	6
Total	**8**	**41**	**60**

[1] Títulos de Participación y Certificados de Cambio. [2] Different securities for each year.

At their peak in 1997, international investors held US$ 1.2 billion of stocks, but since then the value of these portfolios has dropped to a third. Their holdings of fixed income securities suffered an even greater variation: the investments first occurred in 1996, reached $377 million the next year, and had disappeared by 1999.

2.2 Over-the-counter market

A similar pattern can be seen in the over-the-counter market (which includes trading through electronic systems). For example, trading in BR's securities has stopped; there has been a slight decline in transactions in CDs and other private sector securities (down 10% from 1998 to 2000); and trading in government bonds has jumped significantly (up 53% by the close of 2000). In fact, the value of government bonds traded up to June 2001 was greater than that traded in all of 2000. The increase in trading of external government debt, where volumes have tripled since 2000, and in repos should also be noted.

Table 4

Over-the-counter market

(billions of pesos)

Financial instruments	1998	1999	2000	2001[1]
Banco de la República	**17**	**0**	**0**	**0**
Public debt				
Central government bonds issued in Colombian pesos	22	49	81	76
issued in UVR[2]	0	0	24	27
issued in dollars	0	2	1	2
issued in external markets	0	1	4	11
Other public debt bonds	57	15	11	9
Total	**79**	**67**	**121**	**125**
Private debt				
Certificates of deposit	39	31	34	22
Short term deposits	0	4	7	2
Bankers' acceptances	0	0	0	0
Private bonds	8	4	4	3
Commercial papers	0	0	0	0
Convertible bonds	0	0	0	0
Certificates of deposit of constant value	3	0	0	0
Participation in securitisation funds	1	1	1	1
Total	**51**	**40**	**46**	**28**
Money market securities	**98**	**52**	**90**	**32**
Purchase agreements	**67**	**77**	**127**	**54**
Total	312	236	384	239

[1] June 2001. [2] Real value units.

Source: Superintendencia de Valores.

2.3 Interbank market

During the last decade the size of the Colombian interbank market[2] has oscillated between 0.3 and 6% of M3. In the last two years the average volume has been 3.8% of M3, compared to 2.2% for the decade as a whole. This growth has coincided with the increase of banks' investments in fixed income securities.

In recent years BR has carried out changes to achieve a greater stability in the money market. Specifically, it has lowered significantly the level of reserve requirements and reduced the dispersion for different types of deposits. For example, at present, chequing accounts have requirements of 13%,

[2] Both interbank operations and repo operations of financial institutions.

compared to 41% for private accounts and 70% for public accounts in December 1993. In a similar fashion, the structure of reserve requirements has been simplified so that the same types of accounts have the same requirements.[3]

Table 5

Structure of reserve requirements

(in percentages)

Current account deposits, trust funds, special deposits and others	13
Savings deposits, savings accounts, repos and others	6
CDs and other bonds with issuing period of less than 18 months	2.5
CDs and other bonds with issuing period equal to or longer than 18 months, investments with the Treasury	0

Source: Banco de la República

Another important factor in the evolution of the interbank market has been the implicit corridor BR has set for short-term rates to avoid large variations in the interbank rate. The central bank supplies liquidity to the economy through auctions and window facilities. The auctions are Dutch style, where the offers are ranked and allocated in descending interest rate order until the auction amount is completed. All the offers are awarded at the interest rate at which the auctioned amount is completed. All the offers below this cutoff rate are denied. The maximum and minimum bidding rates are limited by the central bank. On the other hand, the liquidity window is a facility through which the credit institutions have access to it at a fixed rate announced by the central bank, which corresponds to the maximum bidding rate from the auction.

Currently, credit institutions have three restrictions on accessing BR's resources. First, they cannot maintain liabilities originated in temporary monetary expansion operations with BR (repos), on average during the last two weeks, for an amount larger than 15% of the stock of their deposit liabilities subject to reserve requirement. In that case they can use the "liquidity support" facility.[4] Secondly, the expansion operations of the central bank can only be backed with certain government bonds.[5] However, this is not a real restriction since most counterparties have enough of these bonds, mostly TES B. Finally, BR establishes on a periodic basis the limits to its liquidity supply at the regular meeting of its Monetary and Exchange Rate Intervention Committee.[6]

[3] In Colombia, the reserve position is defined as the difference between the resources available to credit institutions for meeting the reserve requirement and the reserve requirement. They are calculated every two weeks.

(a) The reserve requirement is an arithmetic average for every working day during the biweekly period (from Wednesday to Tuesday inclusive of every second week).

(b) The resources to achieve the reserve requirement correspond to the arithmetic average of every working day during the biweekly period (from Wednesday to Tuesday inclusive of every second week). Each biweekly period begins one week after the period for calculating the corresponding reserve requirement.

If (a) exceeds (b), then there is an excess daily average.

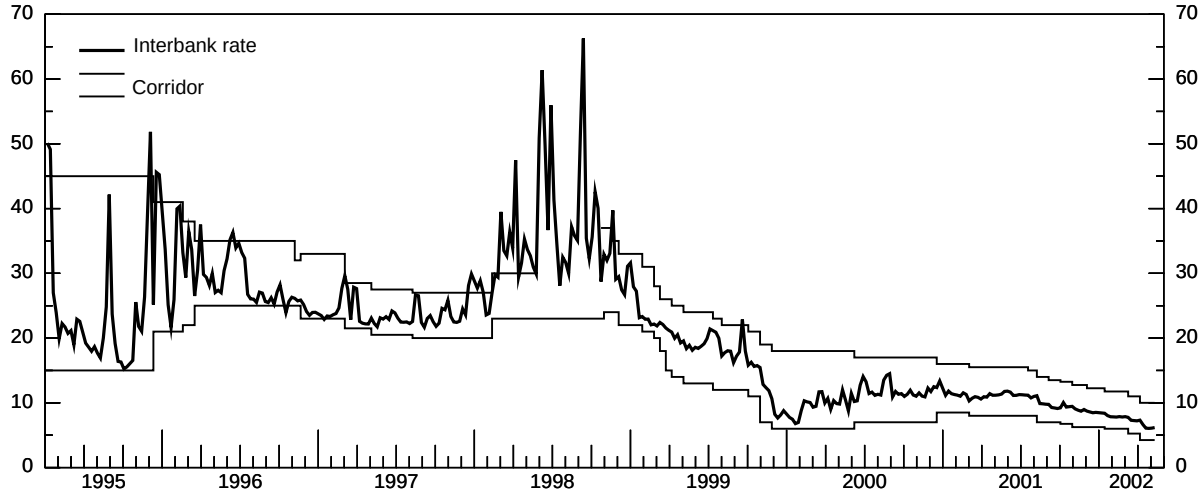
[4] As a lender of last resort, BR has a facility called "liquidity support" through which it lends to financial intermediaries which have temporary liquidity problems. A credit institution can access the central bank's resources for a maximum amount of 15% of the highest liability that the institution had during the 15 days before the date of the requirement. This facility has an initial period of 30 days, extendable for a further 150 days.

[5] Agricultural Development Bonds (TDA), Class B Treasury Bonds (TES B), Class A Treasury Bonds (TES A), Security Bonds (Bonos para la Seguridad), FOGAFIN Bonds, External Debt Bonds from the Nation, Law 546 Treasury Bonds (TES Ley 546) and Debt Reduction Bonds (Títulos de Reducción de Deuda) issued for the rescue of those affected by the crisis in the mortgage system.

[6] Comité de Intervención Monetario y Cambiario (CIMC).

Graph 1

Banco de la República interest rate corridor and interbank rate



The National Treasury actively manages its cash position and at present it is the main agent operating in the money markets. On a daily basis it collects resources, makes payments, enters into repos and participates in the interbank market. And each weekend it presents its cash flow projections to the central bank. When these projections are not met, the central bank implements corrective actions to minimise the effects of deviations on market liquidity.

3. Government bond market

3.1 Background

The foundations for the development of the public debt market were laid in the early 1990s. First, the 1991 Constitution created an independent central bank with strict and clear limits on financing the central government. Second, the reform and liberalisation of the financial market permitted a regulatory framework that increased competition and strengthened intermediaries. And third, the reform of the social security system fostered the consolidation that long-term investors needed to complete the foundations of the government debt market.

In the first year of the last decade, central government financing relied heavily on external sources, particularly syndicated loans and multilateral financial institutions. During subsequent years financing with foreign bonds gained more importance for the central government, and this enhanced the diversification of sources and the speed of disbursements. Meanwhile, central government financing in the local market was concentrated on obligatory placements with the national Social Security Institute (ISS) and other public entities.

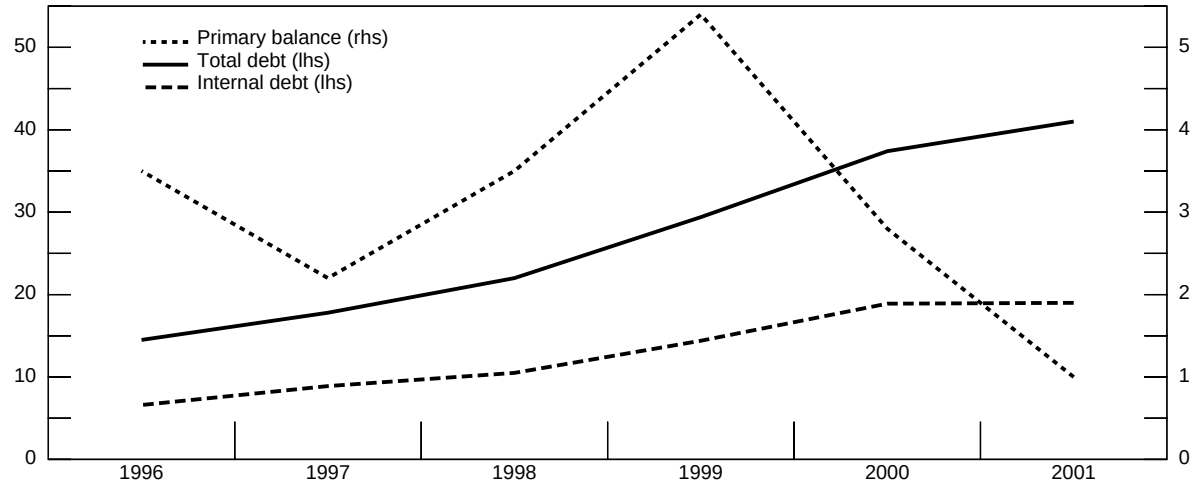
It can be said that central government financing through domestic bonds gained strength in 1996 following:

- the definition of a stable calendar for TES B auctions;
- the selection of specialised intermediaries, market-makers, with privileges and obligations (see below); and
- the construction at BR of a robust and secure information infrastructure to auction, administer, register and trade dematerialised bonds and transfer the related payments.

Graph 2

Ratio of primary balance, total debt and internal debt to GDP

In percentages



Source: Ministry of Finance and Public Credit.

In August 2001 central government domestic debt stood at P37 trillion (and external debt P39 trillion). Of the domestic debt, 82% of it, some P31 trillion, was in TES B and the rest in the other securities listed in footnote 5.

3.2 Central government TES B auctions

The Ministry of Finance and Public Credit designates annually a group of placement agents for treasury bonds: those commercial banks, financial corporations and brokerage firms are referred to as "market-makers".[7] Only the market makers that have successfully bid in the primary auction have access to the additional placement known as the second round. A market-maker's privileges and obligations are determined by their efficient distribution of government debt securities.

Obligations

- All the agents for placement of TES B must be affiliated to the BR's SEBRA[8] network, which includes payment and settlement systems, transactions systems, known as SEN, and security custody, administration and settlement, known as the DCV.
- Commercial banks must have paid capital plus legal reserve exceeding P50 billion (P30 billion for financial corporations) and brokerage firms must have technical equity of over P10 billion.
- They must be rated BBB- or better by a recognised credit rating agency.

[7] There are two classes of market-makers. The main market-makers are those institutions which have acquired over 4% of the total amount auctioned and obtained one of the highest grades for participation in the primary and secondary markets for TES B. "Market-maker candidates" are those that either no longer achieve a sufficient grade or have only acquired over 2% of the amount auctioned.

[8] Electronic Services of the Banco de la República, an electronic transaction system that allows agile, secure and efficient transactions and communications between the central bank and the financial intermediaries.

Privileges

- Exclusive access to the periodic primary auctions of TES B
- Meetings with the Ministry of Finance and BR related to public debt titles
- Opportunity to propose measures to improve the functioning of public debt markets
- Access to the centralised trading system, SEN, and its restricted market for TES B
- Exclusive access to the second-round auctions of TES B.

BR acts as an agent of the central government in the issuing and administration of domestic bonds. It announces on behalf of the Ministry of Finance and Public Credit (up to two working days in advance) the date, size and nominal value of the auction. The Ministry determines the target amount of total financing and periodically announces the level of compliance with the established targets, but it does not provide the market with a specific calendar showing the dates of the auctions. As a consequence, the market does not trade bonds prior to their issuance. Table 6 shows the intended frequency of auctions.

Table 6

Auction dates

Fixed rate in pesos	Wednesday of every monetary week, except the first week of each month.
Inflation-indexed in pesos	Infrequent, as they are being replaced by UVR auctions.
Fixed rate in US dollars	Wednesday or Thursday.
Fixed rate in real value units (UVR)	Wednesday of third monetary week of each month.

Bids are accepted between 10 and 11 am on the day of the auction. BR receives through SEBRA bids from the placement agents, who must supply the nominal value of the bonds they intend to acquire, taking into account the minimum level of issuance and the effective annual interest rate at which they intend to bid for the bonds. All offers are considered firm and no agent can present offers with a total value exceeding the announced size of the auction. Each agent can place several bids but the differences between the interest rates of the bids cannot exceed 150 basis points. Offers exceeding any of these limits will be cancelled.

The Ministry sets the rules for the Dutch-style auctions. Depending on the announced size of the auction, the offers are approved if their interest rate is below or equal to the cutoff rate. All the offers are allocated at the cutoff rate, which can be higher than the interest rate of the offer, so all the favoured participants will obtain the same rate of return. Offers will be approved until the desired quantity of bonds is sold. If the auctioned amount is inferior to the accumulated value of the offers at the cutoff rate, the following criteria will apply:

- the offers presented below the cutoff rate will be approved in their totality; and
- the difference between the total auctioned amount and the approved offers will be proportionally distributed among the remaining offers with the cut rate.

As mentioned above, there is an additional placement of TES B known as the second round. The amount offered then is determined automatically in accordance with the demand in the first round and the size of the auction.

- If the value of the demands is greater than twice the amount auctioned in the first round, the size of the second round will be half that offered in the first round.
- If the value of the demands exceeds 1.2 times (but is less than twice) the amount auctioned in the first round, the second round will be a quarter of that offered in the first round.
- If the value of the demands is less than 1.2 times the amount auctioned in the first round, there will be no second round.

Only those market-makers that participated in the first round and were awarded an amount at the auction can participate in the second round. Each of them can send one and only one offer by maturity, and its value cannot exceed the size of the second round. If this happens, the offer will be cancelled. The cutoff rate will be equal to that of the first round. The offers for the second round must be made between 3 and 4 pm on the same day that the first round was held.

If demand exceeds the amount offered, the offers will be ranked, with the market-maker assigned the largest amount in the first round approved first, the market-maker assigned the second largest amount in the first round approved second and so forth.

3.3 Types of securities

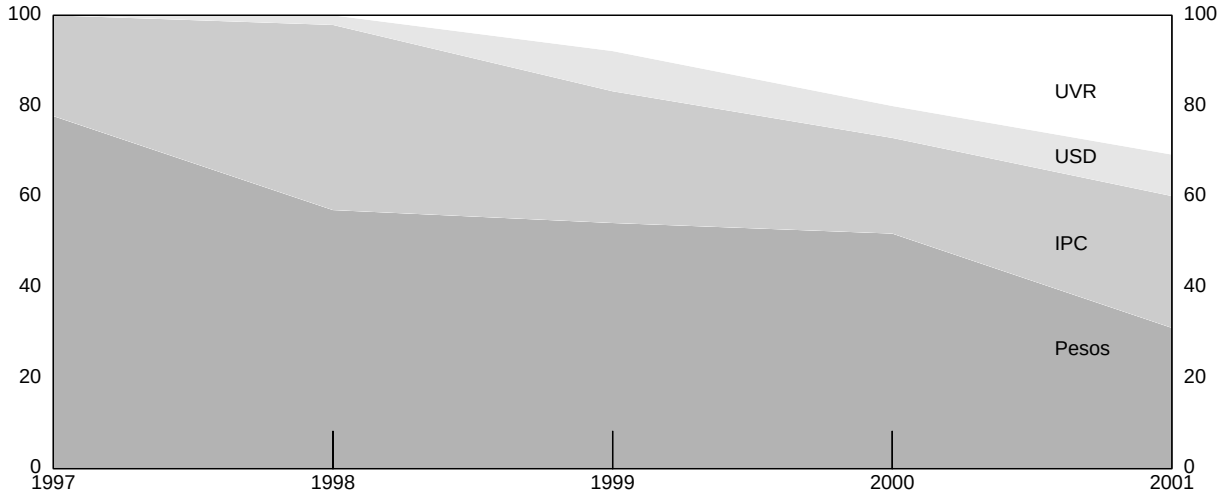
Even though TES B have for some time been the main source of local financing for the central government (and the only one that is carried out directly with the market), the features of these bonds have changed substantially in recent years. There are four types of TES B, as listed in Tables 6 and 7. All TES B bonds are dematerialised and are registered in the Depósito Central de Valores (DCV), the book entry system of the BR. The Ministry of Finance covers the costs of the DCV. A tax of 7% is levied on the return on TES B.

Graph 3 shows that basic peso-denominated TES B accounted for 78% of the total in 1997 but now represent only 31%. Inflation-indexed securities have become more popular. Dollar-denominated TES B were first offered in 1999 but their share has stayed below 10%.

Graph 3

Weight of TES B by type

As a percentage of total stock



Source: Ministry of Finance and Public Credit.

Table 7 shows the same evolution but in the nominal value of the TES B.

Table 7

TES B by type

(in trillions of pesos)

	1997	1998	1999	2000	2001[1]
Fixed rate in pesos	7.7	8.1	11.0	14.0	9.5
Inflation-indexed in pesos	2.2	5.8	5.9	5.7	8.9
Fixed rate in US dollars	0	0.3	1.8	1.9	2.8
Fixed rate in real value units (UVR)	0	0	1.6	5.4	9.4
Total	9.9	14.2	20.3	27.0	30.6

[1] August 2001.

Source: Ministry of Finance and Public Credit.

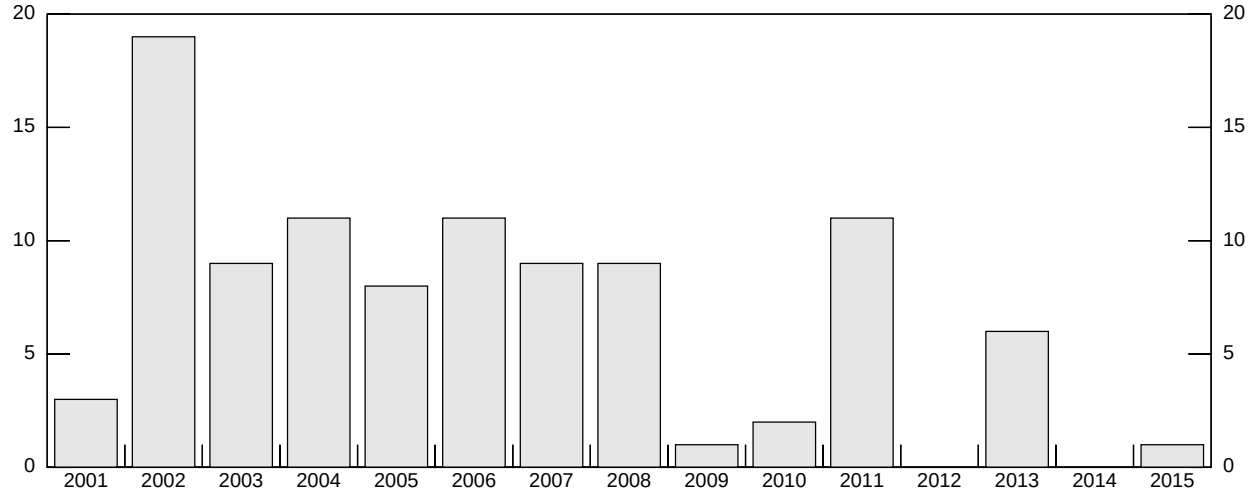
3.4 Average amount and maturity profile of government debt

The average maturity of the domestic debt of the central government has lengthened from less than two years in 1996 to over five years now, mostly due to the issuance of longer term TES Bs. (The average maturity of the foreign debt is a little over six years.) An important step was the successful exchange in June 2001 of peso-denominated TES B soon to mature for those with longer maturities (and in some cases inflation-indexed). The debt exchange was carried out in several auctions by BR and reduced central government debt servicing obligations up to 2002 by P3.8 trillion. Graph 4 shows the maturity profile of all central government domestic debt (not only TES B) with the percentage of the stock that matures each year.

Graph 4

Central government internal debt maturity profile

As a percentage of total stock



Source: Ministry of Finance and Public Credit.

During 2001 the Ministry of Finance placed peso-denominated TES B with maturities of one, two, three, five and seven years; inflation-indexed TES B with maturities of seven and 10 years; and dollar-denominated TES B of two, five and eight years.

Recently BR has authorised the use of up to P 260 trillion of the administration quota for TES B for the issuance of 90-day peso-denominated TES B. It is expected these new instruments will complete the sovereign yield curve and foster the derivatives market in interest rates.

3.5 Secondary market

During an average day in 2000, P44 billion of TES B were traded, equivalent to a turnover ratio of 0.2% of the stock outstanding (P27 trillion). As of August 2001, 46% (P79 billion) of secondary market operations in TES B were conducted on electronic systems, with over-the-counter transactions making up the remainder (Table 8).

Table 8

Public debt market, by trading system

(in billions of pesos)

	Cumulative amount		Percentage share	
	2000	**2001**[1]	**2000**	**2001**[1]
SEN	15.3	47.8	11	27
Colombia Stock Exchange and interface trading	41.9	32.1	31	18
Total electronic systems	57.2	79.9	42	46
Interface booking	80.0	93.9	58	54
Total debt market	137.2	173.8	100	100

[1] August 2001.

Source: Colombia Stock Exchange and SEN.

The average issue size of TES B is P 500 billion (around $200 million). Nevertheless, the Ministry of Finance and Public Credit can increase the size of the issue until it considers it has sufficient liquidity. Table 9 shows the how the increase in liquidity over the last year has narrowed the bid-ask spreads.

Table 9

Narrowing of bid-ask spreads

(in basis points)

TES B in pesos – seven-year maturity	5
– five-year maturity	10
– three-year maturity	10
– two-year maturity	15
TES B in UVR or US dollars	40

In terms of liquidity, the most important maturity among government bonds during 2001 was five years.[9] The preference for longer maturities is explained by expected and confirmed decreases in interest rates.

There are no available statistics on turnover in the derivatives market. However, it is known that some forward rate agreements and swaps are carried out. This slow development is sometimes due to regulations on derivatives and their bookkeeping and sometimes due to the lack of adequate benchmarks. For example, the tradition of pricing off the DTF,[10] the benchmark for credits to the private sector, has restricted the use of the sovereign curve as a reference for short tenors. It is expected that once 90-day peso-denominated TES B gain acceptance, they will be used as the best guide for expectations of interest rates.

3.6 Clearing and settlement system

The main government bonds are deposited in the DCV, a computerised system designed for the management, through electronic registers, of securities issued or managed by BR. Its objectives are to eliminate the risks associated with the physical circulation of bonds and facilitate secondary market transactions and the collection of capital and interest returns. Dematerialised securities of the same specie - with identical characteristics and financial conditions, issue date and maturity - are consolidated in the same electronic register.

The DCV offers online real-time connection, matching of data on seller and buyer, real-time gross settlement, dematerialised bonds, delivery versus payment and settlement finality.

3.7 Public debt: summary

In sum, during recent years the Colombian capital markets has made good progress. Specifically, the central government has moved its financing from captive sources to domestic markets, established a regular auction of standardised securities of increasing maturity and completed its yield curve. During the same period, the competitiveness and sophistication of the financial system increased. For example, risk management systems have been widely adopted, the repo market has matured and a number of electronic and specialised intermediaries, such as brokers, have appeared. Finally, pension funds have taken the lead as long-term investors.

4. BR and the bond market

BR has played a crucial role in developing the government bond market. It has executed temporary monetary expansion with TES B since 1996, permanent monetary expansion since 1998 and temporary and permanent monetary contraction since 1999. BR is also responsible for the auction, administration, registry, transaction and settlement of TES B.

At present BR deals only in government bonds in its open market operations. For temporary operations, BR accepts as guarantee TES B and bonds issued by FOGAFIN (the deposit insurance agency) and FINAGRO (a support agency for coffee growers). For permanent operations, BR prefers to buy TES B. These purchases have helped consolidate the bond market. For example, during 1998 they helped to sustain the price of TES B during the exit of international investors and supported the activity of market-makers.

The permanent monetary expansions in 1999 and 2000 were so large that BR had to resort to auctions, due to the illiquidity of the secondary market. Unfortunately, these auctions distorted the yield curve, increased prices for BR and reduced the overall liquidity of the market. To mitigate these

[9] According to SEN, the issues maturing on 8 November 2005, 3 May 2006 and 4 February 2005 were the most heavily traded up to August 2001, accounting for 53%, 19% and 15% of the total market respectively.

[10] A weighted average of 90-day deposit interest rates from banks, financial corporations, financing companies and mortgage banks. This benchmark is calculated weekly by BR.

negative consequences, BR has since modified its auction system to require bid and ask quotes with a maximum spread. It has also determined that cutoff rates should correlate with market prices, and it has carried out most of its purchases on electronic trading systems.

In June 2001, BR's portfolio of public debt stood at P2.3 trillion, almost totally comprised of TES B (Table 10).

Table 10

BR's public debt portfolio[1]

(in billions of pesos)

	Títulos de Tesorería - TES Clase A	Títulos de Tesorería - TES Clase B[2]	Títulos de Tesorería - TES Ley 546[2]	Bonos FOGAFIN Capitalización BR	Bonos FOGAFIN[3]	Total
1999	307	1,674	0	0	10	1,991
2000	245	2,116	50	474	12	2,897
2001[4]	184	1,764	51	318	12	2,329

[1] Excluding coupons. [2] Bonds TES class B and TES Ley 546 that are denominated in UVR (real value units) were changed to pesos with the last UVR of the respective year. [3] Corresponds to different bonds issued by FOGAFIN. [4] June 2001.

BR has also played a decisive role in the information infrastructure on which the bond market has expanded. BR has created a robust and secure information system for the administration, registry and dematerialised transaction of bonds and for the transfer of the related payments. BR administers the primary placement of government debt through weekly auctions executed electronically, for which payment occurs in real time through SEBRA. These bonds are then registered in the DCV.

As mentioned above, in 1998 BR developed and launched SEN, an electronic trading system for government bonds. This system has considerably facilitated price setting through transparent real-time operations. Finally, with the recent launch of the electronic fixed income trading system of Bolsa de Colombia, the national securities exchange, BR has opened SEBRA, and thus delivery-versus-payment, to other agents.

4.1 Challenges for BR

Even after taking into account these successes, there are still many challenges to consolidate them and support the progress of the rest of the Colombian capital market. For example, BR is currently:

- increasing its coordination with the Ministry of Finance and Public Credit in liquidity management and the development of the public debt market;
- reviewing which bonds, at which price and with which haircuts, it receives and delivers in its temporary expansion and contraction operations;
- analysing which mechanism for permanent expansion (purchase through SEN, spot or forward auctions) creates least distortion to the sovereign yield curve;
- closely tracking the 90-day TES B to see its impact on the sovereign yield curve, and interest rates in general, with the hope it will advance the interest rate derivatives market;
- improving the analysis and administration of its own TES B portfolio and of those it administers for pension funds and the central government; and
- carefully studying the liquidity of the payment system, especially as an important part of the new electronic equity trading system will settle through SEBRA.