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Reducing financial vulnerability: the development of the domestic government bond market in Mexico[1]

There is broad evidence that various initiatives undertaken by the Mexican government have been successful in helping to develop the domestic government bond market. The market has grown rapidly, its maturity structure has lengthened and secondary market liquidity has improved. Primary market auctions have also become more efficient. Notwithstanding these significant advances, some vulnerabilities remain.

JEL classification: E440, G180, H630, O160.

The domestic government bond market has expanded rapidly in Mexico since the mid-1990s. In part, this has reflected a conscious effort by the authorities to develop domestic sources of financing as a means of reducing the country's dependence on external capital flows. The abrupt withdrawal of external capital in late 1994, in what became widely known as the "tequila crisis", resulted in a deep economic and financial crisis in Mexico. This made policymakers acutely aware of the vulnerabilities associated with a heavy reliance on external financing.

The Mexican government has promoted the shift to financing in the domestic market through macroeconomic and structural reforms aimed at strengthening the demand for domestic debt, as well as through the introduction of a clearly defined debt management strategy. These measures have been broadly successful: the government has been able to issue a growing amount of domestic fixed rate securities and to create a long-term yield curve. These are notable developments in a region where short-term or indexed debt remains the rule.

This article describes the efforts made by the authorities to develop the domestic government bond market and analyses the impact that they have had on the amount, composition and liquidity of public sector debt. It concludes with an assessment of the progress made so far and highlights some of the remaining challenges to the market's development.

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Tequila crisis prompts reconsideration of debt management policy

Domestic bond markets have remained underdeveloped for much of Mexico's modern history. Consistent with the general results of Burger and Warnock (2003) for emerging market economies, a poor inflation record and the consequently weak credibility of monetary policy made it practically impossible for the government or other Mexican borrowers to introduce standard long-term debt securities in the domestic market. Indeed, entrenched inflationary expectations meant that lenders were only willing to lend in domestic currency at very short maturities or with returns indexed to inflation, short-term interest rates or the US dollar. They were, of course, also prepared to lend in foreign currencies, principally in US dollars.[2]

Tequila crisis highlights risks of relying on indexed debt …

The tequila crisis of late 1994 was a good example of the risks of relying heavily on dollar-indexed securities. The early 1990s had been characterised not only by a substantial appreciation of the Mexican peso but also by a significant deterioration of the country's current account in spite of steadily improving public sector finances (Agenor and Montiel (1999)). The rapid growth in Mexico's external liabilities created rising fears among investors that the country would have to devalue and/or default on its obligations. During the course of 1994, investors became increasingly reluctant to roll over their short-term peso-denominated cetes and instead shifted their funds to short-term dollar-indexed tesobonos. This provided a temporary respite for the government, but the short-term nature of outstanding securities also meant that the transformation in the structure of debt towards tesobonos was extremely rapid. Whereas tesobonos had accounted for about 4% of domestic debt at the beginning of 1994, they accounted for most of that debt at the end of that year. The sudden withdrawal of foreign investment from the domestic market at the end of 1994 and the ensuing sharp drop in the Mexican peso resulted in an explosive growth in the peso value of dollar-indexed government liabilities, thereby adding a fiscal dimension to the external crisis. The withdrawal of foreign investment led to severe financial instability, followed by a protracted recession.

… and prompts efforts to develop domestic market

The tequila crisis demonstrated that, despite the accomplishments of the Mexican government in the fiscal area in the previous years, the weakness of its debt structure made it vulnerable to the sudden withdrawal of foreign investment. To reduce its reliance on short-term external financing, the government has since made considerable efforts to develop a viable domestic bond market.[3] These efforts have largely focused on improving the demand

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[2] The inability of a country to borrow domestically at longer maturities and/or abroad in its own currency has been referred to in the literature as "original sin" (Eichengreen et al (2003)). Proponents of this hypothesis argue that this condition heightens a country's vulnerability because the accumulation of external liabilities by the public or private sectors makes it hard for countries to service their obligations whenever the exchange rate depreciates. In turn, this exposure reduces the willingness of non-residents to finance countries, makes that financing more sensitive to adverse economic conditions and limits policymakers' room for manoeuvre (Goldstein and Turner (2004) and Borio and Packer (2004)).

[3] For a detailed account of those early efforts, see Sidaoui (2002).

and supply conditions for government debt. Both of these aspects are discussed in the sections that follow.

Strengthening the demand for government debt

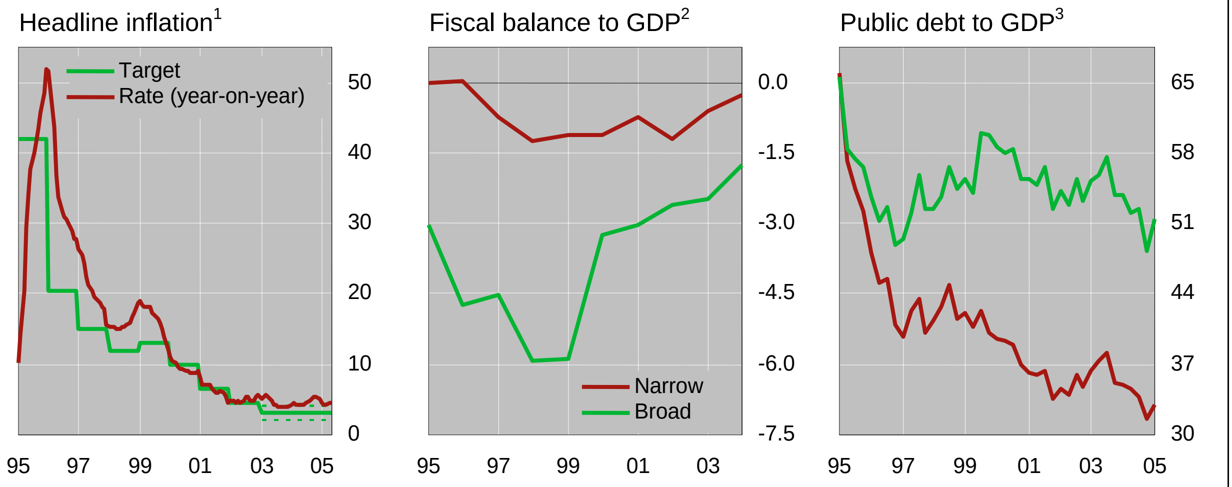
Demand for government debt boosted by stable macroeconomic environment …

One objective of the government's strategy to develop a domestic bond market has been to improve the demand conditions for government debt. Indeed, increased demand has been a major by-product of the more stable macroeconomic environment since the mid-1990s. The Bank of Mexico's monetary policy framework has led to a sustained reduction in inflation, with the rate of increase in the consumer price index declining from 52% in 1995 to slightly below 5% in 2004 (Graph 1). At the same time, the government has been broadly successful in meeting its targeted reductions in the narrow fiscal deficit.[4]

… reform of institutional investment …

Another key element in boosting demand for government debt has been a reform of institutional investment. In 1997, the government implemented a sweeping reform of its pension system for workers in the private sector (schemes for public sector workers were not affected). The existing defined benefit system was replaced by a compulsory defined contribution plan that is fully funded by individual accounts managed by private administrators known as Administradoras de Fondos para el Retiro (AFORES). The new privately managed pension system has experienced rapid growth since its inception, with assets under management rising from virtually nothing in 1997 to

Inflation and fiscal balance



[1] Annualised monthly change in consumer price index; the dotted lines indicate 1% plus/minus the target rate; in per cent. [2] Negative indicates deficit. [3] The Mexican authorities publish two definitions of public deficits. The narrow or traditional definition includes the deficit that is directly under budgetary control. It comprises non-recurrent revenues but excludes part of the interest cost of liabilities issued to rescue banks and highway operators (see the box on page 100) and delays the financial recording of the direct cost of public investment projects. The augmented deficit is defined as the aggregate public sector borrowing requirement less non-recurring revenues. It corrects for a number of omissions in the narrow definition and includes the financing requirements of the above-mentioned rescue operations, deferred investment projects and development banks. In per cent.

Source: Secretaría de Hacienda y Crédito Público. Graph 1

[4] While improvements to the broader public sector deficit have been slower than initially hoped, there has nevertheless been considerable progress (Bank of Mexico (2004)).

MXN 470 billion at the end of 2004, or 6.5% of GDP. About MXN 400 billion of AFORES assets are invested in government securities.

At the end of 1998, a derivatives exchange specialising in the trading of contracts on financial assets, the Mercado Mexicano de Derivados (MexDer), was launched. Activity in fixed income instruments has developed rapidly, although close to 100% of transactions in fixed income contracts have been accounted for by the trading of contracts on the 28-day TIIE rate. Nevertheless, such trading on short-term rates is reported to have benefited the longer segment of the yield curve, to the extent that short-term contracts have been used in the hedging and pricing of longer-term interest rate swap contracts.

… the introduction of derivatives trading …

In 2000, the government adopted a new bankruptcy law that permitted the holders of collateral under repurchase agreements to terminate in advance their transactions by netting their rights and obligations with a defaulting counterparty. The new law was an improvement on the previous bankruptcy legislation, which had required market participants to first settle their obligations and then collect the money owed out of the bankruptcy proceedings. In 2003 and 2004, the government issued new regulations for the repurchase market and securities lending operations, which are expected to boost local and foreign demand for government debt securities.

… and greater legal certainty for repos

Managing the supply of government debt

Since the early 2000s, Mexico has followed a clearly defined public debt management strategy aimed at improving and streamlining the supply of government debt. This overall strategy encompasses five main elements: a shift to the domestic financing of fiscal deficits; a lengthening of the maturity structure of government debt; the development of a liquid domestic yield curve; a move to greater predictability and transparency of debt issuance; and structural initiatives aimed at strengthening the market for government debt.

Mexico is following a clear debt strategy …

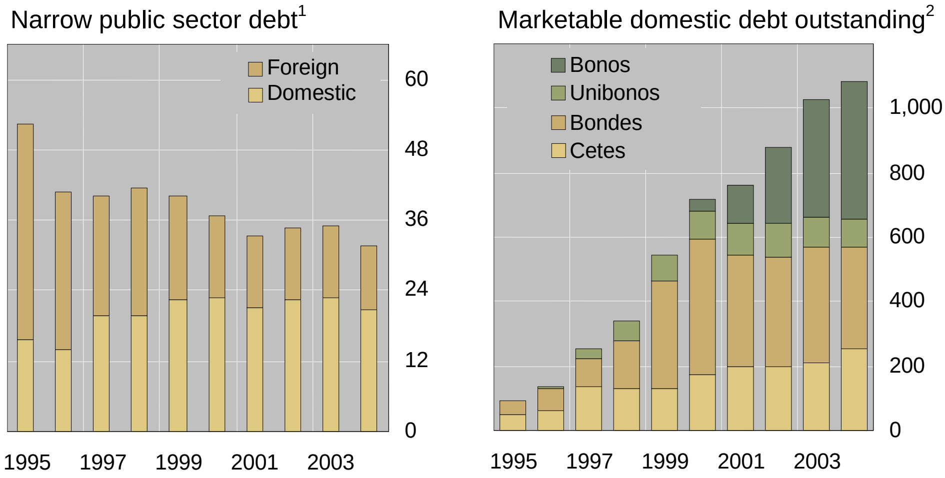
In order to fulfil the first of these broad objectives, the federal government began to shift the financing of its fiscal deficit to the domestic market and to decrease the country's external debt exposure (Graph 2). Since 2001, the entire fiscal deficit has been financed domestically. In 2004, domestic borrowing was used to repay $1.8 billion in external debt, an amount well in excess of the government's planned external debt reduction target of $500 million for that year. As a result, the domestic component of narrow public sector debt rose to 65% at the end of 2004, compared with 30% at the end of 1995.

… which includes a shift to domestic financing …

Since 2000, the federal government has also sought to reduce refinancing risk by a gradual lengthening in the maturity structure of its debt. This has been implemented by lengthening the maturity of debt indexed to short-term interest rates and inflation and by introducing fixed rate bond issues. Fixed rate bonds, with maturities of three and five years, were first issued in 2000, followed by 10-year bonds in 2001, seven-year bonds in 2002 and 20-year bonds in 2003. The federal public debt management programme for 2005 emphasised that the net financial requirements of the federal government would continue to be met largely through longer-term fixed rate securities.

… a lengthening in the maturity structure of debt …

Mexican federal government debt



[1] Total net debt of public sector as a percentage of GDP. [2] In billions of pesos. For discussion of public debt concepts, see the box on page 100.

Source: Secretaría de Hacienda y Crédito Público. Graph 2

... the development of secondary market liquidity ...

The federal government has also taken other steps to develop secondary market liquidity. In particular, it has frequently reopened a small number of reference issues with the intention of building the outstanding amount of each issue until an acceptable degree of liquidity has been reached. In order to avoid an excessive concentration of redemptions on given dates, the government has also adopted a proactive liability management strategy. It recently announced a programme to swap short- for long-maturity bonds. The programme is expected to reduce refinancing risk and the impact on market liquidity of large debt amortisations.

... greater transparency of debt management ...

Predictability and transparency have also been at the heart of the government's debt management strategy. An initial step in the direction of greater predictability was taken in 2002 when the government waived its right to set a cap on the interest rate at which it was willing to accept bids at primary market auctions. Since 2004, the government has been publishing its debt strategy for the whole year, as a complement to the publication of quarterly auctioning targets for each type of government security. Currently, the government announces a quarterly auction calendar specifying supply by type of instrument at each weekly auction and the particular issues to be auctioned during the quarter.

... and structural reform of the primary market ...

In addition, the government has reformed the structure of the domestic debt market. Over the years, primary market auctions of government securities have been opened to a wider range of investors, such as pension funds, mutual funds and insurance companies. The move to a more equitable participation in the bidding process has been accompanied by improvements in the Bank of Mexico's electronic bidding platform, guaranteeing the publication of results within half an hour of the auction's completion, down from five hours in 1993.

Structure of the Mexican domestic federal debt market

The Mexican authorities monitor two concepts of public debt, a narrow and a broad one. The narrow concept comprises the net debt of the federal government and that of a number of other federal entities under direct budgetary control (including social security). The broad definition of debt encompasses the net liabilities of the federal government and those of all other public sector entities. Thus, in addition to the debt of the federal government, it includes the debt of non-financial public enterprises, development banks and extra-budgetary trust funds. It also includes the debt of the Savings Protection Institute (Instituto para la Protección al Ahorro Bancario or IPAB), that of the Trust Fund for the Rescue of Toll Highways (Fideicomiso de Apoyo para el Rescate de Autopistas Concesionadas or FARAC) and that resulting from public sector investment projects with different financial accounts (Proyectos de Infraestructura Diferidos en el Registro del Gasto or PIDIREGAS).

IPAB became operational in 1999 and manages the debt resulting from the rescue of the banking sector in the wake of the financial crisis of late 1994. The federal government provided an implicit guarantee on most bank liabilities at the time and bore much of the cost of banking resolution. IPAB began to issue Bonos de Protección al Ahorro (BPAs) in 2000. FARAC was also established in the aftermath of the financial crisis, with the aim of rescuing private toll companies. It

Main Mexican public sector securities

Securities issued by the federal government					
Instrument	Type of coupon	Maturity	Frequency of issuance	Amount outstanding at end-2000[1]	Amount outstanding at end-2004[1]
Certificados de la Tesorería de la Federación (cetes)	Zero	28, 91, 182 and 364 days	Weekly and monthly	182.7	257.5
Bonos de Desarrollo del Gobierno Federal (bondes)	Indexed to cetes rate	5 years	Biweekly	416.5	310.5
Bonos de Desarrollo del Gobierno Federal Denominados en Unidades de Inversión (udibonos)	Indexed to inflation rate	10 years	Monthly	85.6	84.6
Bonos a Tasa Fija (bonos)	Fixed	3, 5, 7, 10 and 20 years	Monthly	33.3	427.9

Securities issued by other major public sector issuers					
Instrument	Type of coupon	Maturity	Frequency of issuance	Amount outstanding at end-2000[1]	Amount outstanding at end-2004[1]
Bonos de Protección al Ahorro del IPAB (BPAs)	Indexed to cetes rate	3, 5 and 7 years	Weekly and biweekly	69.0	382.5
Bonos de Regulación Monetaria del Banco de México (BREMs)	Indexed to interbank overnight rate	1 and 3 years	Weekly	22.0	232.9
Pagares de Indemnización de Carreteras (PICs) del FARAC	Indexed to inflation rate	20 and 30 years	Monthly	51.1	110.5

[1] In billions of pesos.

Source: The Secretaría de Hacienda y Crédito Público's federal debt programme for the second quarter of 2005.

should be noted that some of the debt issued to finance PIDIREGAS projects is initially assumed by the private sector but then transferred to the federal government upon completion of the projects. Such debt is thus included in the federal debt statistics.

The Secretaría de Hacienda y de Crédito Público (SHCP) has full responsibility for all activities related to federal government debt and coordinates its activities with other federal agencies in determining the type of instruments to be marketed, their amount and the timing of issues. The two main issuers of marketable debt in the domestic market, the federal government and IPAB, announce quarterly calendars which provide guidance to the markets about the volume and composition of forthcoming issuance.

The federal government issues instruments in a wide range of maturities (cetes, bondes, udibonos and bonos) but IPAB focuses on medium-term BPAs that are indexed to 28-, 91- and 182-day cetes rates. The outstanding domestic marketable debt of the federal government and IPAB amounted to MXN 1,081 billion and MXN 383 billion, respectively, at the end of 2004.

The Bank of Mexico has also been an important participant in the domestic debt market. It has traditionally used government securities to add/subtract liquidity to/from the money market, but in 2000 it began to issue its own liabilities, Bonos de Regulación Monetaria del Banco de México (BREMs), to sterilise the steady inflows of foreign exchange reserves. The BREMs, which are securities indexed to daily interbank rates, amounted to MXN 233 billion at the end of 2004. For the Bank of Mexico, sterilisation through such instruments enables it to better meet its monetary policy objectives while causing fewer distortions in the market for government debt. BREMs are not included in the public sector's debt statistics.

… and the secondary market …

In 2000, the government introduced a market-making scheme for government debt. Market-makers committed themselves to bid for a minimum amount of securities at primary market auctions, to make two-way quotes at all times for a minimum amount of fixed income securities and to maintain a cap on the bid-offer spread (currently at 125 basis points). In return for those obligations, market-makers were given the right to participate in a "green shoe" auction[5] that follows the public auction, hold regular meetings with federal debt management authorities and have access to the Bank of Mexico's securities lending window.

… along with easier access to market prices …

The availability of market-determined prices is an essential element for the development of secondary markets and the valuation of intermediaries' portfolios. In recent years, the Bank of Mexico, the Comisión Nacional Bancaria y de Valores (CNBV) and the Bolsa Mexicana de Valores (BMV) have worked together to ensure that market participants have easy access to daily market prices for tradable fixed income securities. These efforts have led to the creation of private price vendors that are in charge of compiling market information from brokers and disseminating it to broader market participants. Most financial intermediaries are now required to use the services offered by authorised price vendors.

… and the launch of a "strips" programme

In 2005, the government launched a Strips Market Operation Programme, which allows participants in the government bond market to strip and reconstitute any bonos and udibonos. The regular reopening by the government of issues with semiannual coupon payment dates allows for the

[5] A green shoe option is given by an issuer to the underwriters for the issuance of additional securities to cover any short position generated by an over-allotment of securities. In this particular case, underwriters can buy up to 20% of the initial amount auctioned at the weighted average price of the auction.

individual interest components of instruments with different maturities to be perfectly interchangeable. The availability of long-dated zero coupon bonds should prove particularly attractive to institutional investors with long investment horizons. It should also help enhance the depth of the secondary market.

Assessing the results of policy initiatives

Policy initiatives are achieving their objectives

There is broad evidence that the various policy initiatives implemented by the Mexican government are achieving their objectives. The domestic government bond market has grown rapidly, its maturity structure has lengthened and secondary market liquidity has improved. There are also signs that the reform of the primary market's structure has had a positive impact on its efficiency.

The domestic market has grown rapidly

The most evident outcome of the government's new debt strategy is that issuance of domestic marketable debt by the federal government has expanded rapidly in recent years, with the stock of outstanding liabilities rising from MXN 158 billion on the eve of the tequila crisis in December 1994 (or 10% of GDP) to MXN 1,081 billion at the end of 2004 (14% of GDP). To be sure, much of the increase in government debt in the second half of the 1990s reflected the issuance of liabilities associated with the rescue of the banking sector and a number of other large private sector entities. Nonetheless, the policy shift to the domestic financing of deficits, combined with the growth of domestic institutional investment and the return of foreign investors to the domestic debt market, has also been important in recent years. Greater foreign involvement in the market is a particularly remarkable development given that foreign investors had largely deserted the market in the second half of the 1990s (Graph 3). By the end of 2004, foreign investors held 7% of the total stock of domestic government debt, up from 2% at the end of 1999.

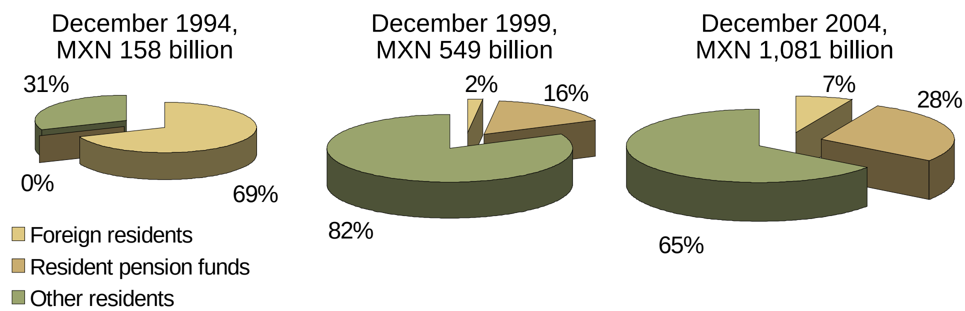
Greater foreign involvement is remarkable

The maturity structure has lengthened

Another significant development has been the lengthening in the maturity structure of government debt (Graph 4). At the end of 1995, domestic debt outstanding had consisted entirely of short-term debt instruments with a maturity of a year or less and debt instruments indexed to short-term interest rates or inflation. By the end of 2004, fixed rate bonds with a maturity longer than one year accounted for 40% of the total stock of debt. As a result, the average maturity of federal securities rose from 288 days in 1995 to 1,070 days

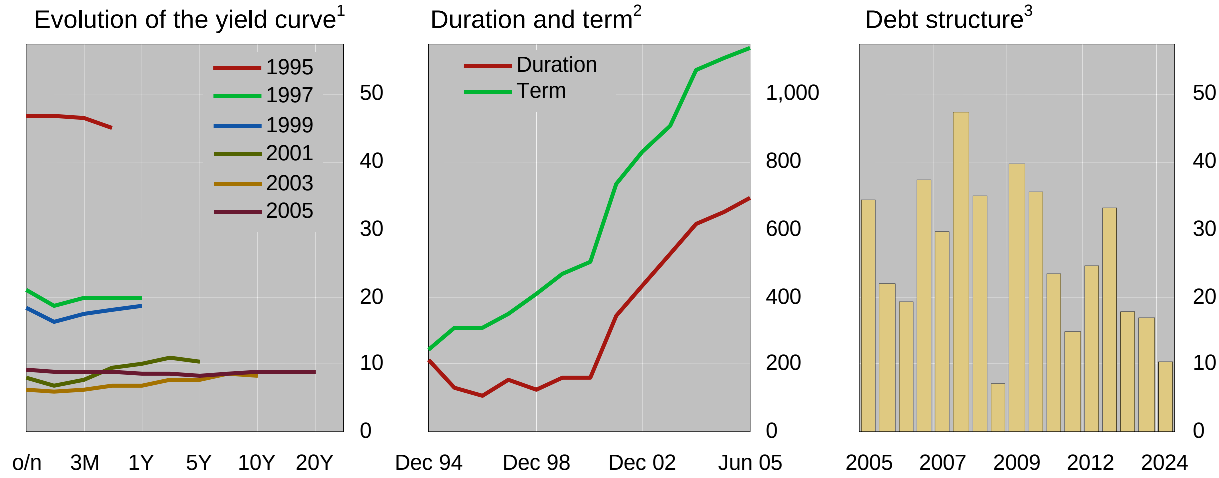
Holdings of Mexican domestic federal government debt

As a share of the total amount outstanding



Source: Bank of Mexico. Graph 3

Yield, duration and maturity structure of Mexican domestic government debt



[1] Annual averages, in per cent. [2] Modified duration in days and average term to maturity. [3] In billions of pesos, as of end-June 2005.

Sources: Bank of Mexico; Secretaría de Hacienda y Crédito Público. Graph 4

in 2004.[6] An important benefit of this extension of maturities is that Mexico is now less vulnerable to refinancing risk. The federal government estimated that at the end of 2004 the impact of an increase in interest rates on the financing cost of its gross debt was about 40% lower than at the end of 2000 (Gil Diaz (2005)).

Foreign investors move to longer-term bonds

The introduction of fixed rate issues in 2000 was made in a context of declining benchmark rates, which ensured a favourable reception by investors. Interestingly, while the tightening of monetary conditions in 2004 prompted Mexican pension funds to shift to shorter-duration assets, foreign investors seemingly adopted an opposite strategy and significantly increased their holdings of longer-term bonds. Foreign investors held 54% of 10-year securities and 84% of 20-year securities at the end of 2004. Their growing participation has helped Mexico to develop the longer-term segment of its domestic bond market.

Contrasting picture of secondary market activity …

Data on secondary market business provide a contrasting picture of activity over time and across debt instruments. There is nevertheless some evidence that the authorities' efforts to improve market liquidity are beginning to bear fruit.

… with declining turnover …

Although secondary market turnover has declined since the early 2000s, this has largely been the result of temporary factors. For one, the introduction of the market-making scheme for government debt in 2000 was accompanied by an initial burst of transactions as intermediaries sought to boost their ranking; this has since given way to a more "normal" pattern of business. Another negative factor that reduced investor demand was the tightening of monetary conditions in 2004. In

[6] It should be noted again that progress has been somewhat slower in the case of broader public sector debt. The marketable debt issued by IPAB has ranged between three and seven years in maturity but has been largely indexed to short-term interest rates, which means that the duration of IPAB securities has remained low (between 30 and 50 days in 2004). However, the average maturity of securities issued by FARAC has been considerably longer, within a range of 20 to 30 years, with all of those securities linked to inflation.

spite of these factors, Mexican domestic government debt has remained the most actively traded local debt in emerging market countries according to the Emerging Markets Traders Association (EMTA (2005)).

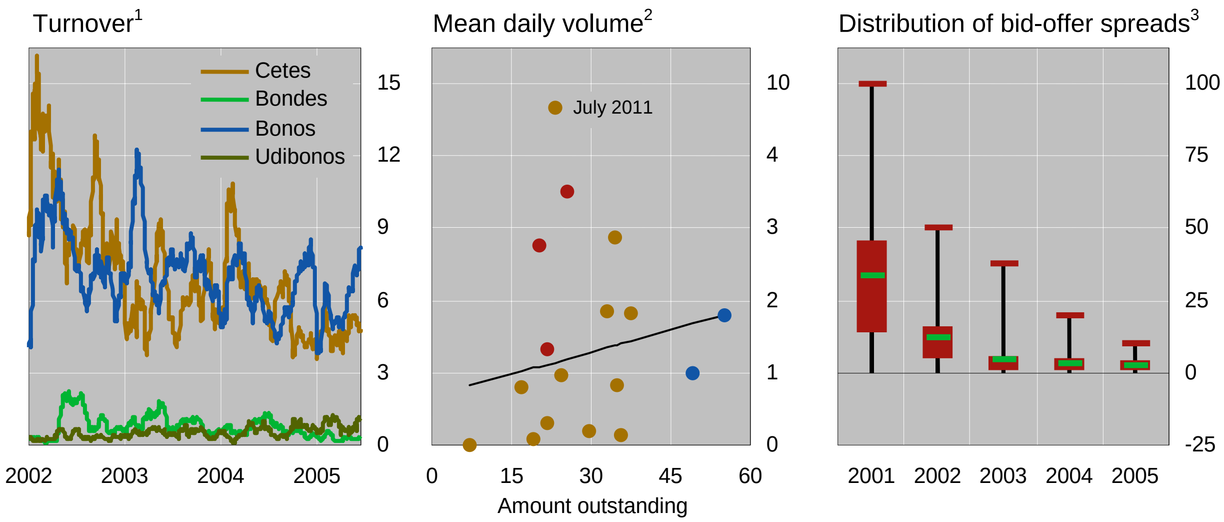
... uneven trading across instruments ...

An analysis of activity across instruments shows that trading in bonos is high but, as is generally the case with indexed securities, activity in bondes and udibonos is limited given that such securities are usually held until maturity by institutional investors (Graph 5). Moreover, trading is uneven across issues of bonos, reflecting the strong popularity of certain on-the-run issues. The notably high concentration of trades in one particular issue, the July 2011 bono, is somewhat surprising. Such concentration of trading probably reflects a preference on the part of intermediaries for tax-exempt securities.[7]

... but improving secondary market liquidity ...

Notwithstanding this uneven pattern of secondary market activity over time and across instruments, there is evidence that the authorities' policy of nurturing liquidity through the creation of increasingly large benchmark issues is producing positive results. The centre panel of Graph 5 shows that there is a positive, even if weak, relationship between the outstanding stock of securities and turnover. Moreover, as shown by the right-hand panel of Graph 5, secondary market liquidity appears to be improving: bid-offer spreads on benchmark issues have come down significantly since the introduction of longer-term securities. In particular, there has been a pronounced reduction in the bid-offer spread on the July 2011 bono as well as a decline in its variation.

Secondary market turnover and bid-offer spreads on Mexican domestic federal government bonds

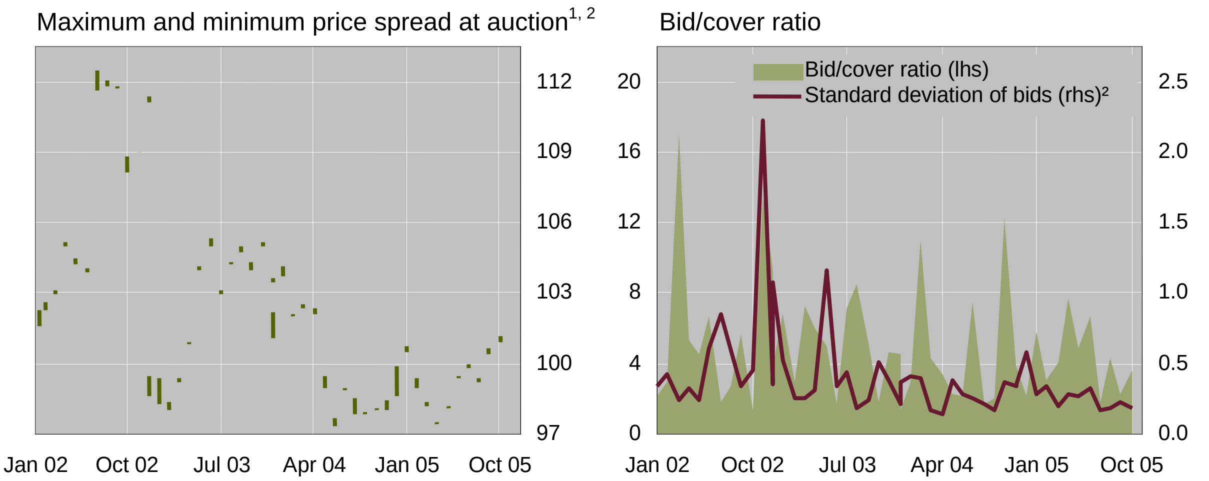


[1] As a percentage of total amount of securities outstanding, in per cent. [2] In billions of pesos. The brown dots represent off-the-run bonds; the red, on-the-run medium- to long-term bonds (seven, 10 and 20 years); and the blue, on-the-run short-term bonds (three and five years). The regression line does not include observations for the July 2011 issue. [3] Calculated on the July 2011 bond, in basis points, based on daily observations, excluding extreme values. The bottom and top horizontal lines for each observation show the minimum and maximum data points for the year, respectively. The box represents the distribution of data points for the 25th to 75th percentiles, and the line within the box shows the mean value of the distribution.

Source: Bank of Mexico. Graph 5

[7] Taxes on interest income were imposed in January 2003. Securities issued before that date remain exempt. The July 2011 bond is the longest tax-exempt bond in circulation.

Primary market prices and coverage ratio of Mexican domestic federal government bonds



[1] Refers to the auction of three-year securities. Each vertical line represents the dispersion of bids submitted at the primary tender, while the dots represent allocated prices. [2] In pesos.

Source: Bank of Mexico. Graph 6

Such an evolution is also observable on other longer-term securities. With bid-offer spreads in the interbank market tending to fluctuate between 3 and 10 basis points for on-the-run issues, participants can generally find a reasonably priced market to increase or unwind their positions. Greater liquidity in the secondary market has reduced the risk premia faced by investors and thus helped lower the government's financing costs.

... and a more efficient primary market

Meanwhile, the measures aimed at the primary market also seem to have improved its efficiency. In contrast to the latter half of the 1990s, primary auctions are no longer plagued by uncertainty regarding amounts to be auctioned and the effects of interest rate ceilings. As a result, the level of maximum and minimum bid prices at primary auctions and their dispersion have followed a declining trend in recent years (Graph 6). This has reduced the price risks faced by intermediaries in the primary market, thus encouraging their participation.

Achievements and remaining challenges

Mexico has made substantial progress in developing its domestic government bond market. This should help mitigate economic and financial stress in the face of potential external shocks. In particular, the shift away from dollar-indexed liabilities has eliminated one potential source of vulnerability of the fiscal accounts, while the move to longer-maturity liabilities has helped to reduce refinancing risks. Moreover, the development of the domestic debt market has led to some improvement in secondary market liquidity, helping to lower the cost of financing for the government. In addition, the greater efficiency of the primary market is contributing to reducing the price risks faced by intermediaries.

Despite these positive developments, there is room for further improvement. The domestic market remains subject to a significant degree of refinancing risk given that short-term and indexed securities still account for 60% of the total stock of debt. What is more, secondary market liquidity remains undeveloped for certain types of securities, particularly index-linked bonds. The wide array of public sector instruments available in the domestic market suggests that efforts to further increase consolidation across instruments could increase liquidity.

One remaining question is whether the return of foreign investors to the domestic market is largely the result of the macroeconomic and structural reforms introduced by the Mexican government over the last decade or primarily reflects international investors' greater appetite for relatively risky assets. Such investors have increased their exposures to a wide range of emerging market country assets in recent years, including to assets from countries that have made little progress in the areas of macroeconomic and structural reforms. A shift to less favourable conditions in global fixed income markets could thus provide an important test of the solidity of Mexico's achievements.

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