André Amante
+5521 2189 5506
andre.amante@bcb.gov.br

Márcio Araujo
+5521 2189 5291
marcio.araujo@bcb.gov.br

Serge Jeanneau
+4161 280 8046
serge.jeanneau@bis.org

The search for liquidity in the Brazilian domestic government bond market[1]

The policy initiatives taken by the Brazilian authorities since the beginning of the decade have helped markedly improve the structure of government debt and the overall liquidity of fixed income and related derivatives markets. Despite this progress, there is room for improvement in the liquidity of the cash market for government bonds.

JEL classification: E440, G180, H630, O160.

The Brazilian domestic government bond market has expanded rapidly since the mid-1990s and is now by far the largest in Latin America. In recent years, economic stabilisation, combined with a favourable external environment, has allowed the government to shift away from short-term, floating rate and/or exchange rate-linked securities to longer-term fixed rate and inflation-indexed liabilities. This new structure of debt has made the country less vulnerable to financial shocks. At the same time, liquidity has developed rapidly in the fixed income derivatives market but there is room for improvement in the cash market. This special feature describes the efforts made by the authorities to develop the domestic government bond market, with a particular focus on the measures recently adopted to foster market liquidity.

Economic stabilisation and debt sustainability

One of the most significant challenges faced by Brazilian policymakers over the past decade has been the need to ensure the sustainability of the country's public debt. From 1995 to 2002, the net debt of the consolidated public sector rose from 28% to 56% of GDP, leading to growing concerns about the sustainability of fiscal policy. This, along with high inflation and macroeconomic instability, forced the government to make frequent adjustments to the currency and maturity composition of its marketable debt. Such adjustments took the form of higher yields on new issues, a shortening of maturities and a growing

[1] The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS or the Central Bank of Brazil (Banco Central do Brasil – BCB). The authors are grateful to Claudio Borio, Már Gudmundsson, Ivan Lima, Frank Packer, Camilo Tovar and Christian Upper for comments and to Rodrigo Mora and Marcus Vinicius Mendes for excellent research assistance.

supply of floating rate and/or dollar-indexed securities. The resulting structure of debt increased the country's vulnerability to domestic and external financial shocks, despite the significant efforts made to improve the overall macroeconomic environment. The severe financial crises of 1999 and 2002 (Herrera (2005)) made policymakers acutely aware of the vulnerabilities associated with heavy reliance on short-term, floating rate and dollar-linked financing. Consequently, much has been done in recent years to develop more stable sources of funding.

Financial crises encourage a shift to more stable debt structures

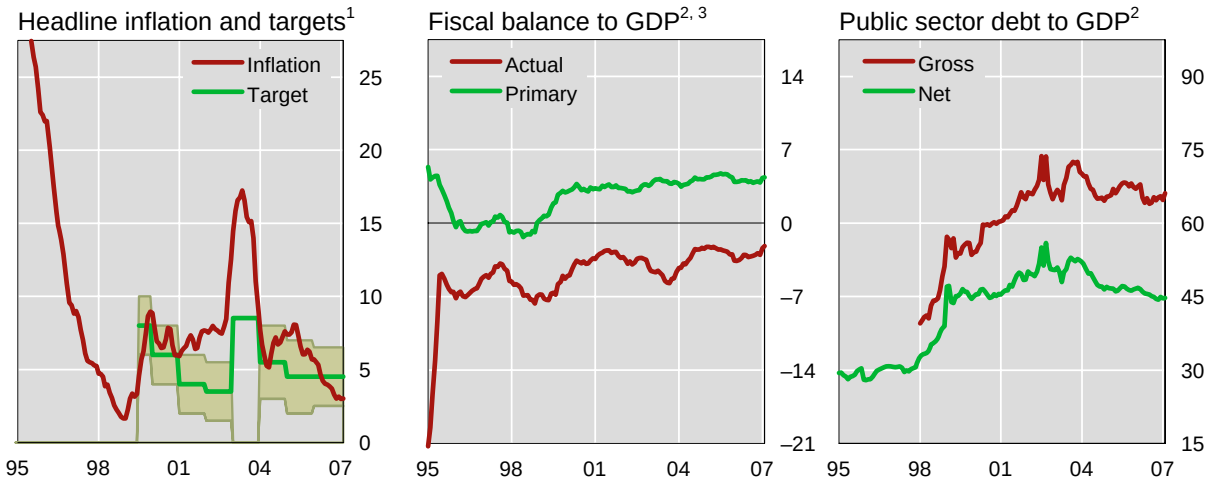
An important element in strengthening the demand for domestic debt has been the pursuit of stabilising macroeconomic policies. The implementation of an inflation targeting regime in July 1999, combined with greater transparency in the formulation of monetary policy, has led to a sustained reduction in inflation and inflation expectations to within the BCB's target range (Graph 1).[2] At the same time, the introduction of the Fiscal Stability Programme (FSP), which imposed stringent targets for the primary surplus, has been broadly successful in bringing debt accumulation under control. The FSP was complemented by the introduction in 2000 of the Fiscal Responsibility Law, which strengthened the federal government's control over the finances of lower levels of government. Moreover, the shift to a flexible exchange rate regime in early 1999 provided the country with greater scope for external adjustment and helped mitigate the strains resulting from speculative currency attacks.

Demand for government debt boosted by stabilising macro policies

In addition to this shift to a new macroeconomic framework, initiatives have been taken in recent years to improve debt management. In 2001, the Treasury began publishing annual financial plans, which provide indicative targets for the overall stock of debt as well as its composition in the coming

Initiatives to improve debt management ...

Inflation, fiscal balance and public sector debt in Brazil

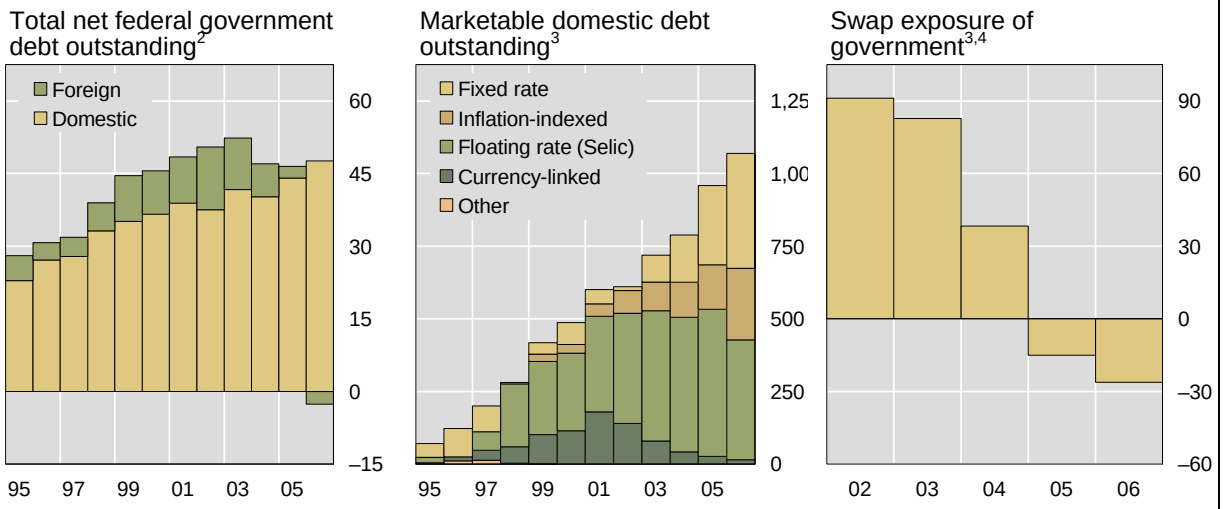


[1] Twelve-month accumulated rate of CPI inflation, in per cent; the target range is ±2% from July 1999 to December 2002; ±0% from January to December 2003; ±2½% from January 2004 to December 2005; and ±2% since January 2006. [2] As a percentage of GDP. [3] Public sector borrowing requirement; flows accumulated over 12 months; a negative figure indicates a deficit.

Sources: BCB; Instituto Brasileiro de Geografia e Estatística. Graph 1

[2] Transparency has been improved by publishing the minutes of the Monetary Policy Committee and quarterly inflation reports.

Brazilian federal government debt[1]



[1] At end-year. [2] As a percentage of GDP; a negative figure indicates a net creditor position. [3] In billions of reais. [4] A positive figure indicates a net liability position.

Source: BCB. Graph 2

year. Such plans have been an important tool in achieving greater predictability and transparency in debt management.

… seek to reduce financing costs and risks

Since 2003, the government has focused its debt management policy on minimising long-term financing costs, while ensuring that risks are kept at prudent levels. Within this framework, and subject to market conditions, the government has aimed at reducing market and refinancing risks by decreasing the share of the federal debt maturing within 12 months and that of floating rate debt, and raising the share of fixed rate debt. In addition, it has worked to phase out domestic dollar-linked debt. Taking into consideration the typically strong demand of institutional investors for inflation-linked securities, the government has also sought to increase the share of such securities.

Progress with policies supported by favourable environment …

The progress made on the macroeconomic and debt management fronts has been supported by a particularly favourable external environment, including robust export growth and a search for yield on the part of international investors. Those economic fundamentals have translated into a strong performance of the currency and expectations of declining interest rates, helping to bring about a significant improvement in the overall composition of domestic debt.

... allowing a shift from floating to fixed rate debt …

The share of floating rate debt has been reduced from more than 50% in the early 2000s to 38% at the end of 2006, while that of fixed rate issues has risen from almost nothing to 36% (Graph 2). The maturity of local currency fixed rate issues now extends to 10 years in the domestic market and 20 years in the international one. Moreover, unlike in the early part of the decade, the government has been able to maintain fixed rate issuance even during periods of rising or volatile interest rates. Meanwhile, currency-linked debt has been phased out, dropping from a high of 37% of domestic debt at the end of 2002 to

… a phasing-out of currency-linked debt …

Structure of the Brazilian domestic federal debt market

The Brazilian authorities focus on two main concepts of public sector debt: the gross general government debt (GGGD) and the net public sector debt (NPSD). The GGGD and NPSD both encompass the three administrative levels of government, but only the NPSD also includes the liabilities of the BCB and state-owned enterprises. These two main concepts of debt include both internal and external debt. The GGGD and NPSD amount to around 65% and 45% of GDP respectively (see Graphs 1 and 2). The NPSD results largely from the netting of domestic assets and liabilities, since the external debt component has declined steadily in recent years. Considering recent issuance, the federal domestic marketable debt (FDMD) corresponds to almost 95% of the NPSD.

The Brazilian Treasury (Secretaria do Tesouro Nacional – STN) is the authority responsible for the issuance and management of public sector debt, both internal and external. It was created in March 1986, when the Comissão de Programação Financeira and the Secretaria de Controle Interno do Ministério da Fazenda were merged. The BCB also plays an important role in the management of public debt since it is in charge of operating primary auctions of public sector securities. In addition, in the conduct of monetary policy, the BCB plays an active role in repurchase operations linked to these bonds. It should be noted that since May 2000 the BCB is no longer authorised to issue its own securities. As a result, the amount of BCB bonds outstanding has declined gradually to nothing.

The FDMD is composed of a wide range of securities, including floating rate, fixed rate, inflation-indexed and dollar-indexed instruments (see Table 1). The LFT, whose floating rate remuneration is based on the Selic rate, is the largest government security in terms of outstanding amounts.① The LTN, a zero coupon fixed rate security, has expanded sharply in recent years and is now the second most important type of outstanding marketable liability. The NTN-F, which is a standard coupon-bearing fixed rate security, has also expanded in recent years. The other NTN securities are indexed to various other indices. The NTN-B and NTN-C, inflation-indexed bonds, have increased their share of total marketable debt in recent years. The NTN-D and NBC-E, US dollar-indexed securities, used to represent a significant share of total marketable debt in Brazil but their participation is minimal nowadays. Overall, the securities discussed in this box represent 95% of the total domestic marketable debt of the federal government. Debt issuance by states and municipalities is modest.

① The Selic is an overnight interest rate based on an average measure of the rates on overnight repurchase operations involving the FDMD.

1.3% at the end of 2006 (or –1.1% if exchange swaps are included).[3] Inflation-linked debt has increased from a marginal amount in the early 2000s to a share of 23% at the end of 2006.

… and a rising share of inflation-linked debt

The steadfast maintenance of large primary surpluses, along with valuation changes related to the appreciation of the currency, brought the net debt of the government down to BRL 1.1 trillion or 45% of GDP at the end of 2006. This reduction has had a beneficial impact on investors' perception of Brazilian sovereign risk, as illustrated by a narrowing of the country's sovereign spread to a historical low of 199 basis points at the end of 2006.[4]

Overall debt reduction has a beneficial impact on sovereign risk

[3] Under such swaps, the BCB assumed a long foreign exchange position and a short interest rate position, with the result that it now has a net long position in currency-linked instruments.

[4] It is worth highlighting that since 2003 gross external debt has been declining and that since 2006 the federal government has been a net external creditor (if one includes foreign exchange reserves).

Main Brazilian federal public sector securities

In billions of reais

Securities issued by the federal government					
Instrument	Type of coupon	Maturity	Frequency of issuance	Amount outstanding at end-2000	Amount outstanding at end-2006
Letras Financeiras do Tesouro (LFT)	Par value indexed to Selic rate	3 and 5 years	Biweekly	260.9	412.0
Letras do Tesouro Nacional (LTN)	Fixed rate zero coupon	9, 18 and 30 months	Weekly	75.4	347.0
Notas do Tesouro Nacional Série F (NTN-F)	Fixed rate with coupon paid semiannually	5 and 7 years	Weekly		48.0
Notas do Tesouro Nacional Série B (NTN-B)	Coupon and par value indexed to Índice Nacional de Preços ao Consumidor Amplo (IPCA) with coupon paid semiannually	3, 5, 9, 18, 29 and 39 years	Biweekly		167.2
Notas do Tesouro Nacional Série C (NTN-C)	Coupon and par value indexed to Índice Geral de Preços de Mercado (IGP-M) with coupon paid semiannually	11, 15 and 25 years	Irregularly	6.9	65.6
Notas do Tesouro Nacional Série D (NTN-D)	Coupon and par value indexed to USD with coupon paid semiannually	6 months to 5 years	Not issued since October 2002	14.8	1.3
Notas do Banco Central do Brasil Série E (NBCE)	Coupon and par value indexed to USD with coupon paid semiannually	6 months to 6 years	No longer issued	83.7	–
Other federal public sector securities				69.00	52.4
Total federal public sector securities				510.7	1,093.5

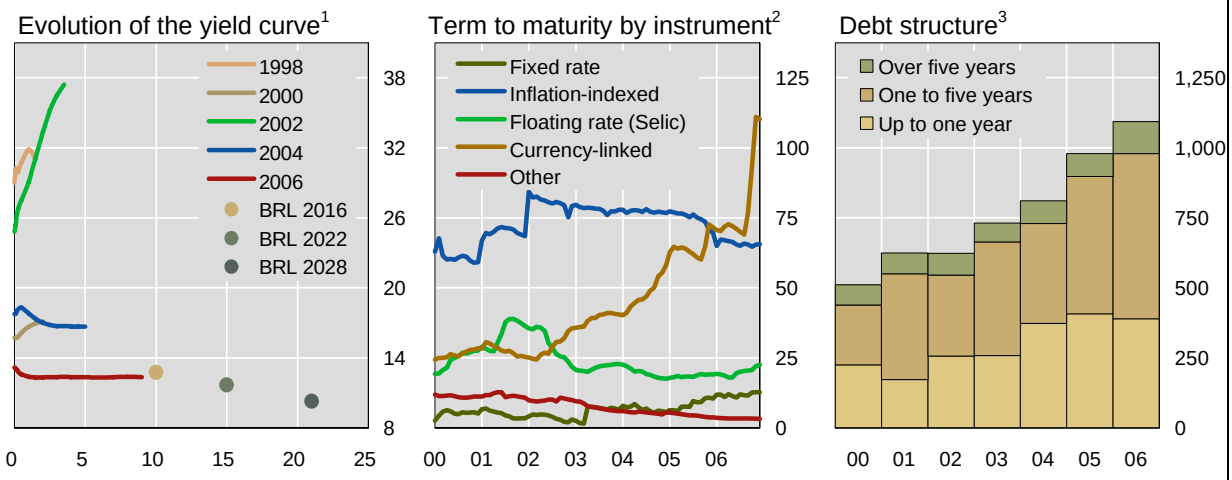
Source : BCB. Table 1

Refinancing risk remains an issue

Notwithstanding this positive evolution, the high share of debt maturing within one year (36% of the total amount of securities held by the public), the relatively short average maturity of fixed rate bonds and the significant share of floating rate debt (Graphs 2 and 3) indicate that the country still remains exposed to higher short-term interest rates and/or refinancing risk (Akira and Callegari (2006), Dias et al (2006)).[5]

[5] It should also be noted that the shift towards fixed rate debt was at the cost of a shorter average maturity. The indexed debt that was retired, particularly currency-linked debt, had a substantially longer maturity than fixed rate debt (Graph 3). The average maturity of the total stock of debt fell steadily from 35 months in 2001 to a low of 27 months in 2005. It began to lengthen again in 2006, edging back to 30 months as the share of fixed rate debt increased and its average maturity lengthened.

Yield and maturity structure of Brazilian domestic federal government debt



[1] Interest rates in per cent against years of 252 days, calculated as a cubic-spline interpolation of the interest rates observed for depositos interfinanceiros (DI) futures contracts at the end of each year; for the global BRL local currency bonds, yields in per cent against years of 365 days; BRL 2016 (12.75% in September 2005), BRL 2022 (11.66% in December 2006), BRL 2028 (10.28% in March 2007). [2] Average term to maturity of outstanding debt held by the public; in months. [3] End of the year; in billions of reais.

Sources: BCB; Bolsa de Mercadorias & Futuros; Câmara de Custódia e Liquidação. Graph 3

Improving market liquidity

Room to improve bond market liquidity

Despite the progress made in developing the government bond market and shifting it to a more stable structure, there would be room to improve its liquidity. There is no unique way of defining market liquidity, but market analysts usually refer to three main characteristics of a liquid market, namely depth, tightness and resilience (see CGFS (1999, 2007) for a more extensive discussion). Depth indicates a market's ability to absorb large transaction volumes without a sharp movement in its equilibrium price; tightness measures the cost-efficiency of transactions, as reflected in bid-ask spreads; resilience indicates the market's ability to absorb shocks. A liquid market would be expected to exhibit large turnover, low bid-ask spreads and low price volatility in normal and stressed periods.

This would yield important benefits

The development of market liquidity is an essential element in the creation of a mature bond market (IMF/WB (2001)). In normal circumstances, higher market liquidity will be reflected in a reduction of the liquidity risk premium embedded in government bond yields, resulting in lower financing costs for the government. In addition, improving the liquidity of the government bond market is of great importance for the development of other financial market segments since it allows for the creation of a representative "risk-free" yield curve to serve as a benchmark in the pricing and trading of other financial assets. Better market liquidity is also of crucial importance for the conduct of monetary policy, since liquid asset markets are required in order to conduct open market operations and extract market expectations. Moreover, market liquidity is important for financial stability since low liquidity or its drying-up under conditions of stress can have significant negative repercussions for the stability of the financial system (Borio (2004)).

Treasury and BCB introduce measures to improve liquidity …

With this in mind, the Treasury and the BCB have introduced a host of measures since 1999 aimed at improving the liquidity of federal government debt.[6] First, they have worked to develop benchmark issues through a reduction in the frequency of offerings and a concentration of issues in a few maturities along the yield curve. Second, the existing primary dealer system for open market operations was complemented in 2003 by the formation of a special group of secondary market trading specialists. In return for meeting certain performance-related targets, these specialists, along with primary dealers, were given financial incentives, such as the ability under certain conditions to purchase government securities in second-round sales at the average price determined by competitive auctions. Third, as part of its new debt management strategy, the Treasury took steps to smooth the maturity profile of domestic debt and promote the development of a local currency yield curve composed of domestic and external issues (see Tovar (2005) for an analysis of international issues in local currency). Fourth, the Treasury announced that it would be prepared to carry out purchase and sale auctions involving selected securities as a means of ensuring liquidity during periods of difficult market conditions. Finally, the BCB introduced a bond lending programme and allowed for the short selling of securities at the longer end of the repurchase market.

… and transparency …

The availability of market-determined prices is an essential element in the development of secondary markets and the valuation of intermediaries' portfolios. In recent years, the BCB and the National Association of Financial Market Institutions (Associação Nacional das Instituições do Mercado Financeiro – ANDIMA) have worked to promote market transparency through the publication of market prices. For example, the prices of transactions in government securities, which are settled through the Sistema Especial de Liquidação e de Custódia (Selic) operated jointly by the BCB and ANDIMA, are now made available daily to market participants. In addition, ANDIMA is developing various benchmark indices to encourage portfolio diversification.[7]

… and broaden the investor base

Measures have also been taken to broaden the domestic and foreign investor bases for local currency securities. These include the introduction of an electronic distribution channel aimed at domestic retail investors (Tesouro Direto), the acceleration and simplification of investment modalities for non-resident investors and a recent exemption of non-resident investors from the 15% withholding tax on fixed income assets (announced in February 2006).

In addition, other measures have focused on improving trading and holding conditions for domestic investors. These include the creation of special investment accounts that exempt individuals and non-financial corporations from the Contribuição Provisória Sobre Movimentação Financeira (CPMF, a 0.38% tax charged on most debits to current accounts) and the introduction of

[6] For a detailed account of these measures, see ANDIMA (2006).

[7] This price information has been complemented by publication by the BCB and the Treasury of periodic press releases which discuss the evolution of the government bond market. See "Open Market Press Release" at www.bcb.gov.br and "Federal Public Debt Monthly Report" at www.stn.fazenda.gov.br.

a new income tax rule that provides for a decline in the tax rate for longer holding periods.[8]

Low liquidity of the cash market

Relatively low volume of secondary market transactions …

Despite the structural initiatives just described, available evidence suggests that liquidity in the cash market for government bonds remains relatively low. The daily volume of all secondary market transactions has amounted to only 1–2% of the total stock of government debt in the past few years. By contrast, turnover in the US bond market, admittedly the most liquid in the world, amounted to about 14% of the stock of US government securities. Turnover in the Brazilian government bond market is also somewhat lower than that in its Mexican counterpart, where daily activity amounts to about 4% of the stock of debt and has been on a rising trend. Of course, such comparisons of activity across countries are subject to the usual caveat about the widely differing nature of national data on turnover.

… including by international investors

Another comparison based on the narrower trading universe compiled by the Emerging Markets Trading Association, which covers yearly trading by its member banks in the debt instruments of the region's largest countries, shows a similar ranking of secondary market transactions. Mexico has by far the most active secondary market, while Brazil has one of the least active ones along with Peru and Venezuela (Jeanneau and Tovar (2006)).

Bid-ask spreads are not particularly tight …

Bid-ask spreads, a measure of tightness, show that the Brazilian fixed rate government bond market is not particularly tight. Spreads on fixed rate bonds stand at about 5 basis points compared with 3–5 basis points in Mexico (Jeanneau and Tovar (2006)). Bid-ask spreads are also significantly wider than in mature bond markets, such as those of the United States, where they range from 1 to 2 basis points. However, as shown in Graph 4, there have been signs of improvement since the early part of the decade.

… but market resilience seems to be improving

Assessing market resilience, the third dimension of liquidity, is a more difficult task. Bond markets in emerging market economies often tend to dry up when they are hit by adverse shocks. Graph 4 shows the daily volatility of local currency bond returns in Brazil in recent years, which could be used as a rough proxy for market resilience. Based on this measure, the Brazilian bond market seems to have become more resilient in recent years. It should be noted, however, that the low level of volatility in recent years may have reflected the prevalence of favourable global and local market conditions as much as a genuine improvement in underlying liquidity. Analysing volatility under substantially less favourable conditions would provide a more convincing test.

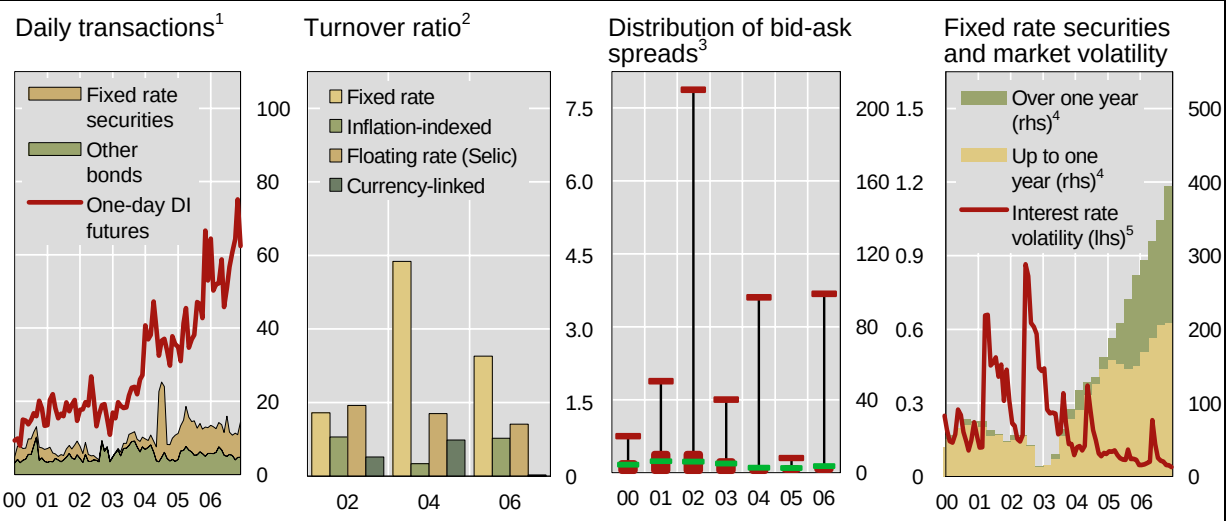
What accounts for low liquidity?

Liquidity is determined by a number of factors, including:

Why has liquidity in the cash market remained so low in recent years in spite of the efforts aimed at nurturing it? In trying to answer this question, we consider,

[8] Funds deposited in investment accounts that are inter alia transferred to mutual funds or used to purchase bonds and other securities are exempted from the CPMF.

Secondary market liquidity of Brazilian domestic federal government debt



[1] Monthly average of daily transactions in billions of reais. [2] Monthly average of daily transactions as a percentage of the amount outstanding at the end of the year. [3] Calculated on all LTN bonds; based on daily observations; in basis points. 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 green line within the box shows the mean value of the distribution. [4] Monthly amounts outstanding, in billions of reais. [5] One-year interest rate volatility for the last day of the month, in per cent.

Source: BCB. Graph 4

in turn, the financial environment, the type of securities traded, the overall size of the market and individual bond issues, tax and regulatory arrangements, the investor base, and the existence of complementary trading instruments, such as fixed income derivatives.

Financial environment

(i) the financial environment, which is improving;

For much of Brazil's financial history, phases of volatility have hampered the development of liquidity in fixed income markets. However, the better macroeconomic and financial environment observed in recent years has created conditions for increased liquidity, particularly in short- to medium-term fixed rate securities. The significant reduction in market volatility since the early part of the decade has encouraged investors to look for added returns at the longer end of the yield curve (Graph 4). This ongoing move to longer-term assets represents a significant change in the behaviour of Brazilian investors.

Type of securities traded

(ii) the type of securities traded, which is not always conducive to active trading;

The type of securities traded can have an effect on secondary market activity. In Brazil, the high rates of inflation experienced until the early 2000s and the various financial crises have led investors to adopt the overnight Certificados de Depósito Interbancário (CDI) and Selic rates as the main trading benchmarks.[9] In spite of the progress made in reducing inflation and financial market volatility, such short-term benchmarks remain popular, as illustrated by the high share of securities indexed to the Selic rate (which represent close to

[9] The two rates are very similar. The CDI rate is for money market transactions without collateral and registered with CETIP, a local clearing house, and the Selic rate is for repurchase transactions with collateral and registered with Selic.

40% of total federal domestic marketable debt). In general, such indexed securities are less actively traded than money market instruments or fixed rate bonds (Graph 4). Floating rate securities play an important role in the cash and debt management practices of financial institutions since they satisfy the demand for short-duration positions. However, market agents have little incentive to trade them for capital gains since the high frequency of coupon resets means that opportunities for such gains are limited. A similar logic applies to the trading of inflation-indexed bonds.

By contrast, as shown in Graph 4, fixed rate bonds are much more actively traded than floating rate securities. They have longer duration and, consequently, more price variation, and for this reason tend to attract speculative investors searching for higher financial returns. As noted earlier, the process of economic and financial stabilisation observed in recent years has supported investment and trading demand for longer duration bonds, particularly fixed rate issues.

Size of market and individual bond issues

(iii) the size of the market …

The size of a bond market and of its individual issues is usually seen as an important determinant of its liquidity. A larger bond market can accommodate more market participants with a greater variety of market views and trading strategies. As a result, there is generally a positive association between the outstanding stock of publicly issued debt and turnover in cash and derivatives markets. Moreover, higher turnover is generally associated with lower bid-ask spreads as market-makers can more easily manage their inventory risks. Judging by the success of government bond futures markets as well as by bid-ask spreads in the G10 countries, McCauley and Remolona (2000) conjecture that there may be a size threshold in the order of $100–200 billion for the development of a deep and liquid bond market.

… which is reasonably large …

With a total amount of BRL 1.1 trillion ($511 billion) in outstanding securities, the Brazilian federal market exceeds that yardstick by a comfortable amount. However, for many years the availability of a wide array of instruments has impeded the build-up of a sufficiently large stock of homogeneous securities for truly active trading. Such an array enabled the Treasury to craft issuance according to the risk-return preference of various niches of investors, which may have had a positive impact on issuing costs. However, the lower liquidity resulting from the lower size of individual market segments limited the reduction in liquidity premia. Nevertheless, the situation is improving, particularly in the fixed rate segment, with the outstanding amount of Letras do Tesouro Nacional (LTN) rising from BRL 14 billion at the end of 2002 to BRL 347 billion at the end of 2006. Moreover, the average size of fixed rate issues has increased from BRL 5 billion in 2002 to BRL 43 billion in 2006.

... but has a wide array of securities;

Tax and regulatory arrangements

(iv) tax and regulatory constraints;

In Brazil, tax arrangements act as a significant constraint on trading operations, particularly on those involving a sale after a short holding period. Individual investors, non-financial corporate entities and certain institutional investors (such as pension funds and insurance companies) are subject to income tax

and at least two transaction taxes, namely the CPMF (mentioned earlier) and the Imposto Sobre Operações Financeiras (IOF or financial operations tax).[10]

Withholding tax no longer applies to foreign investors but is still imposed on domestic individual investors and non-financial companies. In order to favour longer-term investment, the tax now follows a declining schedule of 22.5% to 15% based on the length of the holding period. However, in doing so, it has inadvertently hampered the development of market liquidity, since a higher tax rate is applied for investment strategies favouring short holding periods. The withholding of interest payments at source has created other problems related to the allocation of the tax liabilities on accrued interest (Leal and Carvalhal-da-Silva (2006)).

The IOF is an additional graduated tax that has a restrictive influence on secondary market transactions. Operations are taxed at rates that decline with the length of time an asset is held (from 96% if the asset is kept only for one day to zero if it is kept for more than 30 days). The aim of this tax is again to encourage longer-term holdings.

The recent introduction of special investment accounts that exempt some investments from the CPMF should help improve liquidity. However, the other tax incentives favouring long-term holdings remain.

With respect to regulation, it should be noted that foreign investors must register their purchases of securities with the Brazilian securities regulator and the central bank, and nominate a legal representative that is required to monitor the fiscal status of their transactions. This complicates the investment process for foreign investors.

Investor base

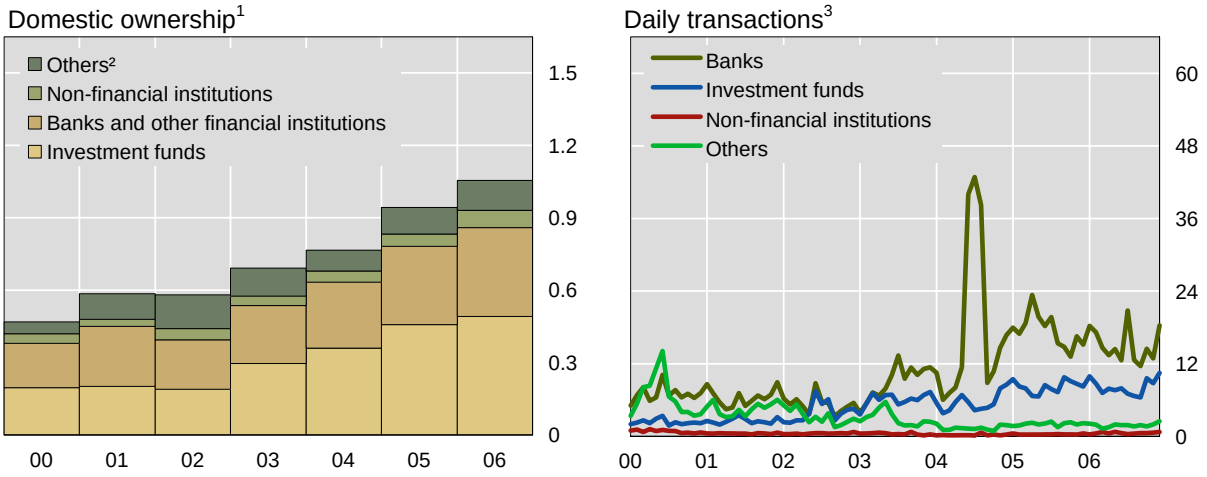
The types of investors and their behaviour can also have a significant influence on trading and liquidity. Brazil has thriving banking, mutual fund, pension fund and insurance industries (OECD (2005)). Mutual funds (termed investment funds in Brazil) are particularly prominent, accounting for 47% of the total ownership of federal government marketable debt. The high concentration of ownership among investment funds emerged after the introduction of the CPMF as underlying investors, principally individuals and non-financial corporate entities, attempted to minimise the incidence of this tax by directing their savings to such funds. As can be seen in Graph 5, investment funds are much less active traders than banks, which hold 34% of marketable debt. Such funds reportedly follow very similar investment strategies (essentially benchmarked to the DI rate), which has acted to limit the extent of contrarian trading.

(v) common investment strategies;

Moreover, the structure of the Brazilian retirement industry has not been conducive to more active trading. In contrast to several other Latin American countries (such as Chile, Colombia, Mexico and Peru), which have introduced private or defined contribution retirement accounts as a substitute for all or part

[10] Banks and other related financial intermediaries are not subject to such tax arrangements when trading in the bond market. Their trading behaviour is therefore not conditioned by those taxes.

Government bond ownership and transactions



[1] At end-year; in trillions of reais. [2] Includes securities used as guarantees to settle operations in various clearing houses. [3] Investment funds include financial investment funds (FIF) and other funds; non-financial institutions include institutional investors; monthly average of daily transactions, in billions of reais.

Sources: BCB; Comissão de Valores Mobiliários. Graph 5

of their pay-as-you-go (PAYG) pension systems, retirement systems in Brazil remain dominated by government-operated PAYG structures. In addition, existing privately funded pension funds are reported to have reached the maturity stage of their payment cycle, which means that they are not in a position to make significant net purchases of government securities (Akira and Callegari (2006)). This has slowed the expansion of investment by privately funded pension funds and acted as a constraint on the diversification of the local investor base.

Key role of derivatives

and (vi) the availability of highly liquid trading alternatives …

Any analysis of market liquidity in Brazil would not be complete without a consideration of activity in other, complementary, market segments, such as exchange-traded derivatives. Indeed, derivatives are a highly cost-effective means of adjusting risk exposures (Euro-currency Standing Committee (1994)). They allow for the unbundling of various kinds of price risks embodied in underlying assets, facilitate the transfer of risks to those more capable of bearing and managing them and permit the establishment of investment and arbitrage strategies that straddle various market segments. These features make derivatives important complementary tools for hedging, position-taking or duration adjustment. They can also act as substitutes for cash market assets in a variety of trading strategies. In some countries, derivatives are more actively traded and liquid than their underlying securities. In fact, with financial markets becoming more sophisticated, fixed income investors may not need to undertake as many cash market transactions as in the past since the risk profile of their portfolios can often be more easily modified through derivative instruments.

… such as derivatives

In Brazil, derivatives play a key role in providing market liquidity. Such markets have benefited to some extent from fiscal and regulatory advantages,

such as partial exemption from the CPMF and reserve requirements.[11] As a result, they have expanded at a brisk pace in recent years. The Contrato Futuro de Taxa Média de Depósitos Interfinanceiros de um día (DI) listed on the Bolsa de Mercadorias & Futuros (BM&F) is more actively traded in notional terms than fixed rate government bonds (Graph 4). The contract simulates a zero coupon bond financed at the CDI overnight rate and offers government bond holders the opportunity to transfer their risk positions in a highly liquid environment and, consequently, at low transaction costs. The futures market contributes strongly to the price formation process given that it is one of the main indicators of interest rate expectations. In fact, the reference yield curve implicit in the DI futures contract is the main benchmark for fixed income investment in Brazil.

Overall, the existence of a well developed futures market has helped to compensate to some extent for low liquidity in the cash market for government securities. Futures have allowed market participants to adjust their risk exposures in a cost-effective manner and helped to build a risk-free yield curve for fixed income markets. The existence of such highly active risk transfer instruments sets Brazilian fixed income markets apart from those of many other emerging market economies.

Concluding remarks

Brazil has made substantial progress in ensuring more stable macroeconomic and financial conditions. The reduction of inflation, the consolidation of fiscal accounts, the control of debt accumulation and the shift to a more flexible exchange rate regime have all had a beneficial impact on the investment climate. This has allowed the country to strengthen its domestic government bond market. In particular, the shift away from dollar-indexed liabilities has eliminated one potential source of vulnerability of the fiscal accounts, while the move to fixed rate debt has helped to reduce interest rate and refinancing risks. This should mitigate financial stress in the face of potential external shocks.

Moreover, Brazil has managed to develop a highly liquid fixed income derivatives market. Such a market has helped in reducing transaction costs to financial market participants and is now providing a recognised reference curve for economic agents. However, there appears to be room to improve liquidity in the cash market for government bonds, where, despite a variety of measures taken by the BCB and the Treasury to enhance liquidity, trading continues to be hampered by structural impediments.

[11] The term partial is used because the CPMF is only imposed on the net amount due on one transaction by one of the counterparties rather than on the notional amount of the transaction. Other indirect tax advantages result from the fiscal authorities' delay in recognising some operations as fixed income transactions.

References

Akira Hashizume, F and J Callegari (2006): "Brazil: the challenges beyond the October elections", JPMorgan Chase Bank, September.

Associação Nacional das Instituições do Mercado Financeiro (ANDIMA) (2006): "Mercado de Balcão de renda fixa: uma agenda de debates".

Borio, C (2004): "Market distress and vanishing liquidity: anatomy and policy options", *BIS Working Papers*, no 158.

Committee on the Global Financial System (1999): "Market liquidity: research findings and selected policy implications", May.

——— (2007): "Financial stability and local currency bond markets", May.

Dias, A, R Jerusalmi, C Ferreira and L F Azambuja (2006): "Brazil snapshot: Quick guide to Brazilian FI local market", Pactual, February.

Euro-currency Standing Committee (1994): "Macroeconomic and monetary policy issues raised by the growth of derivatives markets", Basel.

Herrera, S (2005): "Policy mix, public debt management and fiscal rules: Lessons from the 2002 Brazilian crisis", *World Bank Policy Research Working Paper 3512*, February.

International Monetary Fund/World Bank (2001): "Guidelines for public debt management", March.

Jeanneau, S and C Tovar (2006): "Domestic bond markets in Latin America: achievements and challenges", *BIS Quarterly Review*, June, pp 51–64.

Leal, R PC and A L Carvalhal-da-Silva (2006): "The development of the Brazilian bond market", mimeo, May.

McCauley, R and E Remolona (2000): "Size and liquidity of government bond markets", *BIS Quarterly Review*, November, pp 52–60.

Organisation for Economic Co-operation and Development (2005): "*OECD Economic Surveys: Brazil*".

Tovar, C (2005): "International government debt denominated in local currency: recent developments in Latin America", *BIS Quarterly Review*, December, pp 109–18.