The World Bank

Technical Notes

Instruments to tap capital markets for funding in housing and related considerations concerning the Sistema Brasileiro de Poupança e Empréstimo (SBPE)

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Abbreviations

ABECIP	Associação Brasileira das Entidades de Crédito Imobiliário e Poupança
ARM	Adjustable-rate mortgage
BNDES	Banco Nacional de Desenvolvimento Econômico e Social
BRL	Brazilian Real
CBPP	Covered bond purchase program
CEF	Caixa Econômica Federal
CMB	Covered mortgage bond
CMN	Conselho Monetário Nacional (National Monetary Council)
CPI	Consumer Price Index
CRI	Certificado de Recebiveis Imobiliários
ECBC	European Covered Bond Council
FCVS	Fundo de Compensação de Variações Salariais (Compensation Fund for Salary Variations)
FGTS	Fundo de Garantia por Tempo de Serviçco (National Severance/Provident Fund)
FII	Fundo de investimento imobiliário
FRM	Fixed rate mortgage
FSS	Financial System Strategy
IPCA	Índice de Preços ao Consumidor Amplo
IGP-M	Índice Geral de Preços do Mercado
INPC	Índice Nacional de Preços ao Consumidor
JMRC	Jordan Mortgage Refinance Company
LCI	Letras de Crédito Imobiliário (Real Estate Notes)
LF	Liquidity facility
LH	Letra hipotecária (Mortgage Notes)
MBS	Mortgage backed securities
MCMV	Minha Casa Minha Vida
NCB	National central bank
PLAM	Price level adjusted mortgage
PML	Primary mortgage lender
RMBS	Residential mortgage backed securities
SAC	Serial amortization
SBPE	Sistema Brasileiro de Poupança e Empréstimo (Brazilian Savings and Loan System)
SELIC	Long term interest rate on Brazilian government bonds
SFH	Sistema Financeiro de Habitação (Housing Finance System, a directed credit system with funding coming from FGTS and SBPE)
SFI	Sistema Financeiro Imobiliário (Real Estate Finance System, a market-based system)
SHF	Sociedad Hipotecaria Federal
TR	Taxa Referential (reference index)
UDI	Unidad de inversion
UPAC	Unidad de poder adquisitivo constante
UVR	Unidad de valor real

1. Introduction

At the request of the Secretariat of Economic Policy (SPE) at the Brazilian Ministry of Finance (Fazenda), the World Bank[1] carried out a second phase of the Non-Lending Technical Assistance (NLTA) aimed at supporting the Government's ongoing housing sector reform efforts. Work provided under Phase II of the NLTA focused on two interrelated issues:

1. Proposing the introduction of new instruments which will allow lenders to raise long-term funds from the capital markets; and
2. Identifying options to ensure a better alignment of the *Sistema Financeiro de Habitação* (SFH), with its two pillars SBPE and FGTS, with the introduction of new capital market instruments.

Economic growth is stimulating demand for mortgages. Favorable economic growth rates over recent years have stimulated property markets in Brazil. Mortgage lending is also growing, albeit from a very low base. In 2005, outstanding mortgage debt to GDP amounted to 1.4 % of GDP and is fast approaching 5 % of GDP this year. House prices and lending volumes in Brazil have been driven by several factors:

- *Rising incomes*: During the past eight years, the number of Brazilian households with incomes higher than ten times the minimum wage rose by more than 50 percent, to around 19 million.
- *Greater availability of mortgages*: Recent changes in regulations on foreclosure, which have improved the legal position of lenders towards borrowers, have incentivized lenders to enter the mortgage market.
- *Supply constraints*, namely the shortage of affordable, transport-accessible and serviced land in the main metropolitan regions such as Sao Paulo and Rio de Janeiro, are driving house prices.
- *The Minha Casa Minha Vida (MCMV) Program*, introduced by the Federal Government in 2009 in response to the financial crisis, has also had an important impact on the housing supply and finance markets, by attracting formal developers to the low-income housing market (a segment they had hitherto shied away from). In parallel, the MCMV Program and the important infrastructure investment under PAC in Brazil have also been linked with a shortage of labor and accordingly rising wages in the construction sector.

Rapidly rising housing prices, especially in Sao Paulo and Rio de Janeiro, have led several observers to question whether a housing bubble was in the making, and as such whether the rapidly growing housing finance market could be impact in case of a sudden drop of housing prices due to a bursting of the bubble. Nonetheless, significant house price inflation has been observed mainly in Brazil's largest economic centers. The development of a house price index is

[1] The team consisted of Sameh Wahba (Sector Leader, LCSSD, Co-TTL), Friedemann Roy (Sr. Housing Finance Specialist, GCMNB, Co-TTL), Hans-Joachim Dübel (Capital Markets Consultant) and Eduardo Rottmann (Real Estate/Housing Market Consultant).

underway. It should allow for a better assessment of house price inflation in different cities/areas of the country.

Market observers [2] do not believe that a large drop in prices would have the same knock-on effect as it did in the United States because the total mortgage stock is lower (5% of GDP in comparison with 72 % in the US before the credit crunch) and underwriting practices of lenders are considered prudent. For example, loan-to-value ratios are typically less than 80 % (in SBPE they average around 60 %). Brazilians also cannot get mortgages on second homes. A further increase of mortgage lending activities could pose a risk for the economy if mortgage lending activities were concentrated at a lender which would a systemic impact on the country and if these activities accounted for a major share of its overall lending activities. To date, the Central Bank has not raised any concerns; but some caution may be warranted.

The housing deficit estimated at about 6.3 million houses (after the one million units of Phase I of MCMV) provides another buffer against a property bubble. Some experts argue that the recent price rises at the top end are simply a correction after many years in which quality housing could be picked up cheaply by the few people who were able to pay in cash. Thus, it seems that the housing boom is grounded in rising prosperity rather than excessive debt.

Another reason for the increased demand for funds to be channeled into housing is the launch of the second phase of the MCMV Program, in which the Government would support the delivery of an additional 2m affordable housing units for limited income families earning below 10 minimum wages. The success of the second planned phase of MCMV depends on a strong involvement of private lenders to provide housing loans to low income groups. Financing the expansion of MCMV without the participation of private lenders would overstretch the capacities and the regulatory lending limits of state-owned lenders (like Caixa Economica Federal—CEF, which until very recently was the only financial agent active in the low-income housing market segment until the entry of Banco do Brasil).

However, traditional funding channels for mortgages are projected to be depleted. Rising demand for mortgages has been financed by the two pillars of the Brazilian Housing Finance System (SFH or *Sistema Financeiro de Habitação*) and has put strains on available funding as the volume of new originations has exceeded the inflow of savings by about 50 % during recent years. The SBPE lender trade association, ABECIP, estimates that the pool of available SBPE deposits could be depleted by 2013/2014 if the mortgage market continues to grow at the same levels. By this time, originations are expected to exceed 65 % of SBPE deposits (i.e. the funding limit).[3] ABECIP bases its projections on an assumed annual growth of 15 % of SBPE deposits

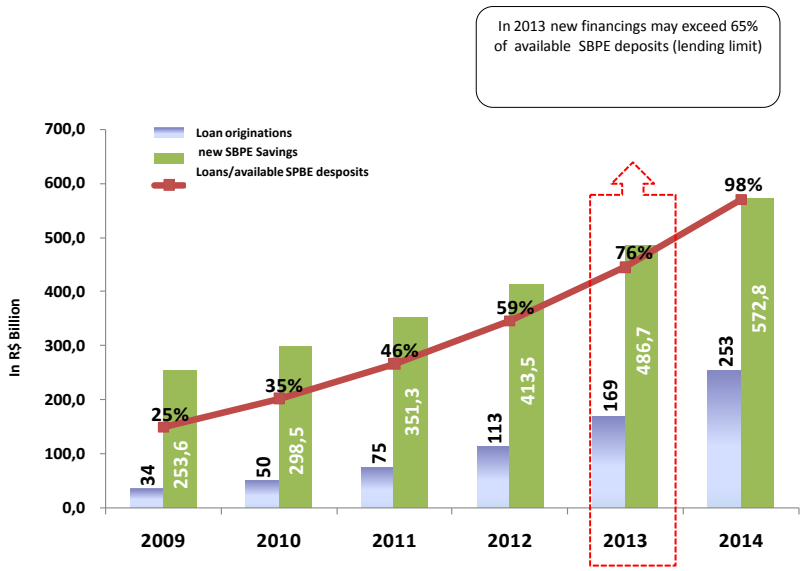
[2] See The Economist, Latin America's housing boom: It's not all froth, May 7, 2011.

[3] Under the rules of the SFH, 65 % of the SBPE savings collected shall be invested for real estate financing purposes (i.e. loans for the purchase or the construction of housing units), of which 80 % (i.e. 52 % of the total SBPE deposits) must be invested in housing loans within the SFH up to maximum property value of BRL 500,000 (i.e. SFH limit). Other regulations refer to maximum loan to value ratios and maximum permissible age limits. SBPE does not apply any direct income limits, but the SFH limits approximate income ranges (5 – 15 MW). The remaining 20% (i.e. 13 % of the total SBPE deposits) can be invested into housing loans at free market conditions. 15 % of the

and 50 % of new originations and continued positive macroeconomic development. Figure 1 illustrates these projections.[4]

The rising use of SBPE deposits also implies an increasing exposure to liquidity and interest rate risk that a growing reliance on short-term SBPE deposits implies. The SBPE system is exposed to interest rate risk because of the applied indexation. SBPE deposits and loans are indexed to TR whereas market interest rate largely rely on SELIC (Sistema Especial de Liquidação e de Custódia).

Figure 1. Projected growth of SBPE deposits versus new originations of SBPE loans



Source: ABECIP

The other pillar of the SFH, FGTS, has also not proven successful in increasing finance for housing (in particular low-income groups): (i) access to FGTS funds for private lenders is largely restricted due to the administrative and operational structure of the FGTS system; (ii) the MCMV program, which relies to a great extent on FGTS funds, has put additional strains on FGTS funds.

Wider use of capital market instruments as another option has unfortunately thus far been limited, for the following reasons. The principal reason is found in the separation of the SFH system and capital market funding mechanisms:

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total SBPE deposits shall be deposited at the Central Bank as a reserve requirement and the remaining 20 % of the total SBPE deposits can be invested into cash or treasury securities, or in lending activities related to the real estate sector.

[4] The team verified these assumptions and arrived at similar results i.e. the lending limit would be reached by 2013/2014. See under Annex 2 under "SBPE: exposure to liquidity and interest rate risk.

- In particular, the SFH system has led to an artificial market which has restricted risk-adjusted pricing of loans and funding instruments. Under the current market conditions, capital market instruments cannot compete with SBPE and FGTS deposits. For example, the high funding cost of *Certificados de Recebiveis Imobiliários* (CRIs) issuances (300 to 400 basis points higher than SBPE deposits) has proven to be too expensive for lenders in comparison with the relatively cheaper SBPE funds (which are priced at TR + 6 percentage points).
- The second pillar of the Brazilian housing finance system, *Sistema Financeiro Imobiliário* (SFI), cannot even fulfill its original mandate (to complement the SFH system) because a funding mix of SFI and SFH sources is not possible due to the use of different indices;
- The SFH system finances residential mortgages and the SFI system mainly serves to finance commercial real estate credit. The systems are only linked through regulatory arbitrage, leading to mismatches of indices and increased unmanaged exposure to credit risk of SBPE deposits and liquidity risk. Other instruments like *Letras de Crédito Imobiliário* (LCIs) or *Letras hipotecárias* (LHs) are exposed to the same constraints. [5]
- Additional reasons for the limited use of capital market instruments are the lack of standardization and high transaction costs, especially of CRI issuances, the lack of investor sophistication and interest, and a domestic capital market in its early years of development..

To ensure sufficient funding for housing, it is recommended to identity new funding channels and reorganize the traditional ones. As SBPE deposits have been available to date, other funding instruments have not been considered (e.g. regular deposits) or have not been able to compete with the relatively cheaper SPBE deposits (capital market funding).[6]

In view of changing market conditions, the need for the identification of additional funding tools arises. To allow these instruments or tools to develop, however, the traditional funding channels (i.e. SBPE and FGTS) would require a number of modifications. Otherwise, any new instrument to be introduced to the market is likely to face the same obstacles as already experienced in the development of the SFI system.

The Ministry of Finance has identified further development of capital market instruments as the main avenue to channel more long-term funds into housing. The availability of longer term funds at lower cost is also likely to improve housing affordability for low-income households. In response to Fazenda's request, two technical notes were prepared, respectively on (a) alternative instruments to tap capital markets for housing finance, and (b) the interrelated issue of SBPE. These two detailed notes are included as Annexes, and their conclusions and recommendations are summarized in this concise consolidated note.

The objective of the first paper (Annex 1) is to promote the funding of mortgage loans through the capital market. In response to the request of Fazenda, a brief note was prepared including a

[5] The level of regulatory arbitrage may have decreased in the last years as the share of SBPE deposits invested into CRIs or LCI/LHs constantly decreased over the last years. It is understood that new regulations have been introduced which makes this type of investment less attractive for banks.
[6] See Annex 2 under point 2 for a detailed list of reasons.

review of funding models that already exist in comparator countries or which are considered a tool to support the development of the capital market. This note also formulates some questions that the Government may need to consider in case it decides to move forward with one of the proposed instruments. The note also highlights issues which are considered relevant to the introduction of covered mortgage bonds (CMBs), an alternative that Fazenda is considering with interest. As such, and at the request of SPE, a funding request has been submitted for FIRST Initiative within the Bank to continue the technical assistance.

As experience in western Europe has shown, the covered mortgage bond has developed into a distinct alternative to government bonds within fixed income securities. The introduction of a system of CMBs is poised to propel the wider development of the capital market, in particular to stimulate a wider investor base which is interested to invest into the Brazilian fixed income market. CMBs are typically priced only slightly higher than government bonds. Investors can increase returns on their portfolios with a minimal increase in risks.

Since the development of capital markets is closely linked to the SBPE system and its success may hinge on some possible adjustments to the system, the objective of the second paper (Annex 2) is to present Government with some considerations in this regard. The proposed recommendations would allow for co-existence of both the SBPE system and any new funding tool in the capital market. Favorable growth rates paired with prudent macroeconomic stabilization policies offer to Government the opportunity to consider the various options laid out in the two papers and develop appropriate solutions.

It is important to note that, at the request of the Ministry of Finance, the Bank is also undertaking concurrent analytical work on a Financial Sector Strategy, which provides technical assistance to the Government in the wider development of capital markets, including on such issues as the role of public institutions in raising long term funds, and how to raise more long-term funds from the private sector, etc. The present work has been closely coordinated with the above-noted Financial Sector Strategy to ensure alignment of the main messages and recommendations underlying the issues of long-term finance and capital market development.

2. The development of capital market instruments for housing finance

Mobilization of funds from capital markets to be channeled into housing is closely related to developments in the SFH system. To date, the features of the SFH system have prevented lenders from tapping funds in the capital market. Differing interest rate regimes are one main reason for reticence of lenders. Whereas interest rates in the SFH system are regulated, interests rate movements in the capital markets are mainly subject to supply and demand of funds. Due to the use of different indices, an alignment between the two funding mechanisms is rather difficult to achieve for lenders. A stronger reliance on capital market instruments would therefore also depend on adjustments to the SFH system.

Several instruments that could be used by lenders to obtain funding from the capital markets for their mortgage loan portfolios were under consideration by the Government or were deemed of interest to further explore:

- Establishment of a fund to buy and sell private securities with minor state participation (*fundo de liquidez para titulos privados*). One of the main roles of the fund will be to operate as a market maker to facilitate trading in the secondary market. To finance the operations, the fund will rely on equity. The issuance of debt was not being envisaged by the Government.
- Establishment of a liquidity facility as a tool to foster mortgage market development. A liquidity facility (LF) is a financial institution designed to support long-term lending activities by Primary Mortgage Lenders (PML). The core function of a LF is to act as an intermediary between PMLs and the bond market, with the objective of providing long term funds at better rates and under better terms and conditions than individual PMLs might be able to obtain if acting alone.
- Covered mortgage bonds (CMBs). A CMB is a debt instrument which is secured against a dynamic pool of specifically identified, eligible mortgages. The fundamental concept of this security is the reliance on the collateral (mortgage) as the primary source of credit quality, which significantly reduces the risk to the bondholder. Mortgage bonds are issued by a bank and usually remain on its balance sheet. The credit quality of the bonds is assured through conservative underwriting standards and strict regulation of loans and lending institutions as well as strict valuation rules.
- Other proposals contemplated by the Government include: (i) introduction of tax exemptions for interest income for investors in long-term debt instruments, such as *Letras Financeiras* (unsecured bank bonds) debentures, etc; (ii) creation of Superfund/subfund structure for FIIs (*Fundo de investimento imobiliário*) to allow for tax-efficient investments into various FIIs, including those backed by loan portfolios. FIIs have recently been allowed to invest into CRIs. The interest income from these investments benefits from tax exemptions.

Of the various proposals made to promote long-term funding through the capital market, the introduction of a system of covered mortgages bonds is recommended to promote long-term funding to be channeled into housing. This funding instrument was developed in Europe some 200 years ago in Germany and Denmark. Today, most European countries have enacted specific legislation on this instrument. CMBs are the most important asset class after government bonds. This approach is gaining traction with the Government and Fazenda is keen on developing the concept and instrument.

In view of the development of financing instruments for housing finance, covered mortgage bonds could complement the current corporate bond instrument menu by offering long-term investment opportunities to investors. They allow channeling long term funds at low cost to housing. CMBs could improve the risk-return profile of the Brazilian pension industry by altering its portfolio composition and facilitate the exit from an investment strategy biased towards stocks and sovereign bond holdings. As LCIs/LHs have similar features to CMBs, wide

acceptance among issuers and investors would be expected. In particular, LHs represent a less sophisticated variant of CMBs. However, LCIs/LHs do not offer the same criteria and security enhancements as CMBs do. This situation should facilitate the sale of CMBs to investors as the financial community is already acquainted with the basic features of CMBs and they will appreciate the enhanced security features. Therefore, CMB issuers will be able to count on wide market acceptance from the beginning. This aspect is poised to propel the usage of CMBs and increase the likelihood of channeling more funds towards low income housing projects. In addition, the broader SPBE regulatory framework provides strong incentives for those banks that do not engage in housing lending to acquire the mortgage securities issued by other active banks; in the past, CEF issued LHs to finance its affordable housing portfolio. A similar trend is likely to take place through the issuance of CMBs.

As already mentioned above, the success of a strong capital markets depends to a great extent on adjustments to the SFH system. An improved integration of capital market instruments and the funding tools of the SFH system would facilitate lenders' liquidity and risk management and would avail more capital to finance housing. The next section (and the second study in Annex 2) outlines areas of potential adjustments of the SBPE system, one of the pillars of the SHF system. The main areas to be taken into consideration are the selection of indexation instruments and recommendations on changes in the fiscal support offered to SBPE deposit holders.

3. Related considerations and reform options of the SBPE system

This section (and the related note in Annex 2) focuses on four issues: (i) the Brazilian housing finance context, (ii) the exposure of the SBPE system to liquidity risk and interest rate risk, (iii) selection of indexation instruments and (iv) the issue of fiscal support.

The Brazilian housing finance context

Economic growth in Brazil has not only stimulated mortgage lending but also increased demand for infrastructure financing, corporate finance and financing of the government budget. As economic growth is expected to continue, the pressure to develop alternative funding models or instruments will arise as it is understood that the available institutional and savings are not sufficient to fund all the different needs which compete for funding. In comparison with other BRIC countries, Brazil's domestic savings rate is lower. To close this gap, Brazil either could accelerate the development of the local capital markets (in particular the fixed income segment) or seek external funding.

Other countries like Mexico or Spain have relied on external capital flows to fund mortgage loan portfolios. Central Eastern European countries like Romania, Hungary or the Baltic States also have benefitted from external capital flows to develop mortgage lending. The capital provided was predominantly short-term which exposed the countries' financial sectors to considerable liquidity risk and presented a risk to financial stability. The majority of the mortgage loan portfolios were funded by credit lines in foreign currency. During the global financial crisis,

especially Central Eastern European countries suffered from receding external capital inflows, leading to a collapse of domestic mortgage markets. By contrast, Chile, which focused on the development of the domestic capital market, did not experience the same degree of volatility as other countries.

In Brazil, policies have focused on the limitation of foreign capital inflows. To stimulate the supply of capital, the Government is keen on developing the domestic capital market, in particular the fixed income segment.

Deeper domestic capital markets would be favorable for the stability of the financial sector and the preferable source for funding future housing loan portfolio growth. Their development would imply a further strengthening of securitization and bank bond markets, which should be able to target groups of investors with differing cash flow structures and credit enhancement features. The Brazilian pension fund industry for example is at present highly exposed to government bonds and stocks and funds are keen on diversifying their portfolios.

SBPE: exposure to liquidity risk and interest rate risk

The development of market interest rates has a considerable impact on inflow and outflows of SBPE deposits. Interest rates on SBPE deposits are tied to the index TR plus a fix spread of 6 percentage points (TR + 6). If market interest rates go up, the inflow of new SBPE deposits may decrease as investors seek other investments. Market interest rates in Brazil are largely determined by the SELIC. At present, the SELIC is fixed by the Central Bank at 12 %. The gap between the SBPE deposit rate and the SELIC (thereafter "the SBPE – SELIC gap") also exposes lenders to spread compression and complicates liquidity management because interest rates on loans are capped at TR + 12 %.

A closer alignment of the SPBE deposit rate and the SELIC is likely to reduce liquidity risk and interest rate risk of the SBPE system and improve the overall stability of the SBPE system. As it is expected that the Central Bank will further raise the SELIC, deposit growth may slow down.

We find empirically that any 1% widening of the SBPE – SELIC gap is likely to reduce the growth of new SBPE deposits by 1.5 -2 %. However, actual savings behavior indicates a more stable inflow of SPBE deposits irrespective of the SBPE – SELIC gap. A considerable share of SBPE deposits could be considered core deposits. One reason for this suggestion is that households use their SBPE deposits as transaction accounts.[7] Given that about 40 % of SBPE deposits are held by 1 % of the SBPE passbook holders, this suggestion should be read with caution in view of the data analysis.

In 2009, new inflows of SBPE deposits have decreased and were negative in 2005 and 2006. The TR index is poised to reinforce the SBPE-SELIC gap due to the underlying construction of the index. A negative SBPE-SELIC gap could be problematic for lenders as well because lenders may not adjust the SBPE deposit rate and are exposed to shrinking margins.

[7] SBPE deposits are callable on a monthly basis by the saver.

The current benign macroeconomic conditions provide an opportunity to adjust the index construction of the TR and the fixed interest rate regime to a system that is closer to market conditions. Alternatively, a new index closer to the market or an exit to nominal lending could be sought. The note in Annex 2 includes recommendations for the selection of an alternative index to TR.

Under varying scenarios, we estimate that the 65% SBPE lending limit will be reached in aggregate between 2013 and 2015. Lenders consider this limit the critical liquidity constraint. Given the strong rise in SBPE lending, some lenders are likely to face liquidity shortages as early as 2011.

To ease liquidity constraints, Government could modify the composition of the allocation of the SBPE deposits. For example, it could lower the minimum reserve requirement of 20 % of the SBPE deposits. Such measures could delay liquidity constraints for a certain period but may not solve the inherent design challenges of the system.

As already mentioned above, the interest rate regime of the SBPE system exposes lenders to considerable liquidity risk. Especially the floor of TR + 6 % on deposits increases the exposure to interest rate risk when market interest rates fall below this floor. This risk varies with the size of the non-SBPE portfolio of the banks. Smaller banks are understood to be more exposed to this risk. To improve interest rate risk management, it is recommended that lenders be allowed to adjust SBPE deposits below the current floor.

To improve liquidity risk management, long-term deposits should be preferred over short-term deposits. One idea would be to reinstate the previously existing 3-month minimum holding period for SBPE deposits, which was cancelled in the mid-1980s during a period of high inflation. Another idea would be to differentiate the remuneration of SBPE deposits by holding period. Shorter holding periods would bear a lower interest rate and longer holding periods would be rewarded with a higher return on deposits.

If Government still wishes to maintain a certain floor of the SBPE deposit rate, it could replace the floor by a band within which SBPE deposits would be allowed to fluctuate. Within this band, lenders would be allowed to adjust the SBPE deposit rate. Such a policy could nurture product innovation and allow lenders to manage better any spread compression.

Selection of indexation instruments and transition to nominal lending

In Brazil, two types of indices dominate: (i) indices based on banks' cost of funds and (ii) indices linked to inflation. Both types of indices have a different impact on credit risk and cost of funds. To facilitate the blending of different funding sources, lenders would prefer the abolition of the TR or at least an alignment of the TR construction to indices used in connection with other funding instruments.

There are several examples of index reforms in comparator countries. Spain introduced its current 'big bang' index reform by initiative of the government (1994). Mexico and Colombia

introduced reforms in 1995 and 1999. Reforms covered modified indices of all housing finance transactions irrespective of the funding instrument used (e.g. savings or capital market instruments). Reforms also included the offer of a small menu of regulated alternatives, which allowed for a transition to lending in local currency.

To allow for a coherent development of the SBPE regime and capital market instruments, a harmonization of indices is recommended. Any reforms of the index regime should not preclude differing interest rates on SPBE deposits (charged over the index) and capital market rates.

For the selection of an index, Latin American comparator experience could provide guidance. Mexico and Chile, for example, have opted for lagged monthly price inflation. Colombia has exited to nominal (Peso) lending after having adopted inflation indexation. A similar practice is used in Spain. Both in Mexico and Colombia, bank cost-of-fund indexation has failed due to interest rate shocks.

The selection of a consumer price index (CPI) would be deemed a feasible option if a reformed TR composition proved impossible to implement. A frequently proposed CPI for mortgage market purposes in Brazil is the retail price index IPCA, which has the advantage of lower volatility compared with the wholesale price index IGPM. Feedback from market participants indicates preference for the IPCA as the index of choice. In addition, to avoid confusion among investors about the composition of the index, an index which is already applied in the market would be preferred. IPCA meets this condition.

Under current macroeconomic conditions, a transition from TR to IPCA could increase credit risk because of higher short-term volatility of the adjustment of outstanding SBPE loans. Although the initial payment burden would be lower for SBPE borrowers, they would be exposed to higher payment shocks in case the interest rate on the loan rises due to an increase in the index.

The risk of a payment could be mitigated by maintaining the serial amortization regime (SAC) and the maintenance of conservative underwriting standards and bank regulations (e.g. adequate LTV ratios, or declining LTV ratios in case of rising house prices).

Should lending rates in Brazil drop below 8 to 10 % over a longer period, the abolition of the indexation system could be considered. International experience has shown that interest rate equal or below this level is a threshold for the kick-off of a viable mortgage market.

A nominal interest rate system has considerable advantages over an indexation regime in view of credit risk, bank funding strategies as well as being acceptable to domestic and foreign investors. The abolition of the indexation system should only be pursued if the decrease in interest rates was sustainable in the long term. Colombia has successfully exited from indexation to nominal Peso lending, and Mexico is increasing its nominal Peso market share.

Given the negative experience in Southern European countries (in particular Spain) with changes to the regulations on interest rate regimes, a particularly important lesson that emerged was that

any liberalization ought to be accompanied by strict regulations on underwriting standards (in particular conservative LTV ratios). In Spain, the relaxation of underwriting standards and the existence of non-amortizing loans have induced excess lending to the housing sector.

Fiscal support

Best practice suggests that a tax policy which is supportive of a savings bank system targets specific market failures and reduces distortions. In the Brazilian case, an important market failure is the lack of long-term savings, which is due to the inflation history and credit concerns of investors. This has prevented better interest rate matching of lenders. Reserve requirements de-facto function as a tax and are equally undifferentiated. One reason for the distortion in mortgage finance is the lack of differentiation in the tax treatment of short-term SBPE deposits and longer term capital market instruments, such as *Certificados de Recebiveis Imobiliários* (CRIs).

To improve liquidity management within the SPBE system, interest income on SPBE deposits should be wholly or partly exempt from personal income tax, depending on their maturity. For example, minimum eligible deposit maturities for personal income tax exemption should be from 3 months upwards. A term of 3 months is considered a minimum maturity acceptable for housing finance purposes.

Deposits with maturity greater than 3 months could bear additional incentives, e.g. a higher exemption rate. Over time any tax concessions on short term deposits should be phased out and eventually the practice of directing long-term credit to housing financed by short-term deposits should be abandoned.

Another option is the differentiation of reserve requirements according to deposit maturities. In this case, longer maturities would be subject to lower reserve requirements.

4. Concluding remarks and next steps

One of the main policy objectives of the Government is to improve access to affordable housing for low income groups. The Bank's NLTA to Fazenda has supported this objective through, under the first phase, support to the expansion of private lenders' participation in housing finance and improvement to the sustainability of such instruments as the Guarantee and Insurance Funds, and in the current phase, support to the expansion of capital markets for housing finance.

The next step would be to further pursue the development of a framework for CMBs (for which the Bank, at the request of Fazenda, has approached FIRST Technical Assistance Program for support).This would include the preparation of a draft legal/regulatory framework setting the basic framework for the issuance of domestic covered bonds and prudential regulations to be enacted by Government and/or supervisory agencies to allow for an effective application of the covered bond law.

Annex 1. Instruments to tap capital markets for funding housing in Brazil

This paper responds to Fazenda's request for information about covered mortgage bonds (CMBs) and liquidity facilities and provides an assessment of the idea of creating a fund to buy and sell securities. The paper is structured in the following way: first, it provides an analysis of the recent developments of secondary mortgage markets and the existing obstacles to a wider use of capital market funding instruments. Second, it deals with CMBs. Third, it gives feedback on the proposed fund and fourth, it deals with liquidity facilities. Each section concludes with questions that would likely be raised if such instruments were considered for introduction to support the mortgage market development in Brazil.

1. Instruments to finance real estate transactions in the capital market

The Brazilian housing finance system is based on two pillars: (i) Sistema Financeiro de Habitação (SFH) and (ii) Sistema Financeiro Imobiliário (SFI). While the SFH relies on savings collected either through the SBPE or the FGTS system, the SFI taps the Brazilian capital market for the funding of mortgage loans.[8] One major component of the SFI comprises the issuance of mortgage backed securities or (CRIs) by securitization companies.

The SFI was established in 1997 by the SFI law (L-9514/97). The role of the SFI is to complement the SFH by offering an additional channel to fund mortgage loans (through the capital market), using MBS.[9] As users of the SFI, parties are free to determine the terms and conditions of their financing arrangements.[10] In contrast, the SFH is prescriptive with regard to investment allocations and lending terms. At present, the SFI system mainly serves to finance commercial real estate credit whereas the SFH finances residential mortgage loans.

The CRIs issued under the SFI framework are one of a number of instruments used to finance real estate transactions in the capital market. There are linkages among CRIs and other capital market funding instruments which are explained below. The following instruments are available:

Certificados de Recebiveis Imobiliários (CRI). CRIs are bonds backed by mortgages. Only securitization companies are entitled to issue CRIs. Securitization companies are conduits which buy loans from banks (true sales) and finance purchases through the issuance of these instruments in the capital market. CRIs are generally issued in multiple tranches, the senior

[8] To date, foreigners have not purchased CRIs.

[9] See uqbar, "An Introduction to the Brazilian Real Estate Finance and Securitization Markets, www.uqubaronline.com, 2007, page 7.

[10] Four conditions have to be met: (i) total amount borrowed is to be repaid; (ii) interest is paid as contractually determined; (iii) interest is accrued; and (iv) borrower has life and disability insurance.

trance sold into the market and the most junior tranche remaining with the securitization company. Terms of CRIs are on average ten years. Interest income from CRIs is tax exempt.[11]

Letras de Crédito Imobiliário (LCIs)/Letras hipotecárias (LHs). LCIs/LHs are bonds backed by real estate credits. They differ from CRIs in that a true sale of the underlying credit is not achieved; therefore the bond and the credit remain on the books of the issuer. Terms are on average 2 – 3 years. Their maturities regularly do not match the terms of the underlying mortgage loans. Interest income from LCI/LHs is tax exempt. Typically, banks issue LCIs and Mortgage Companies issue LHs.

Cédulas de Crédito Imobiliário (CCIs). CCIs are similar to an electronic mortgage note which allows securitization companies to more easily take a security interest in the residential property against which a CCV loan has been made.[12] CCIs are backed by either a deed of trust (alienação fiduciária) or a mortgage (hipoteca). These loan pools can then be transformed into CRIs. For developers, it is a common way to securitize their real estate receivables.

Other instruments related to capital market financing. (i) Debentures are unsecured bonds backed by the integrity of the issuer and not by collateral. They typically finance corporate activities (e.g. of a developer) or consumer loans. Interest income from debentures is not tax exempt. (ii) Certificados de Depósito (CDs) or Certificados de Depósito Interbancário (CDIs) are time deposits. Their interest rates are linked to the SELIC. (iii) Other instruments are equities issued by developers and real estate investment funds or fundos de investimento imobiliário (FIIs). There are different variants of FIIs: closed funds or open funds, or funds which invest in one particular real estate project or in several projects (typically commercial properties). The funds of FIIs can also be invested into CRIs. Open FIIs are traded on the stock exchange.

Chart 1 shows the individual volume of each capital market instrument: the total volume of new issuances of CRIs, LCIs, LHs and CCIs amounts to BRL 42.5 billion at the end of 2009 (about USD 24 billion).[13] Data for 2010 are not yet available, except for the SPBE system. In 2010, lending volumes rose further. For example, the volume of new loans financed by SBPE deposits rose from BRL 34 billion to BRL 56 billion. The number of outstanding loans in the SBPE system amounted to BRL 137 billion in 2010 (increase by about 37 % in comparison with last year).

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[11] The tax exemption applies for individuals and FIIs. The tax rate for other investors is 20 %. The same regime applies for investments of individuals into LCIs/LHs. There is, however, a different tax regulation for institutional investors.

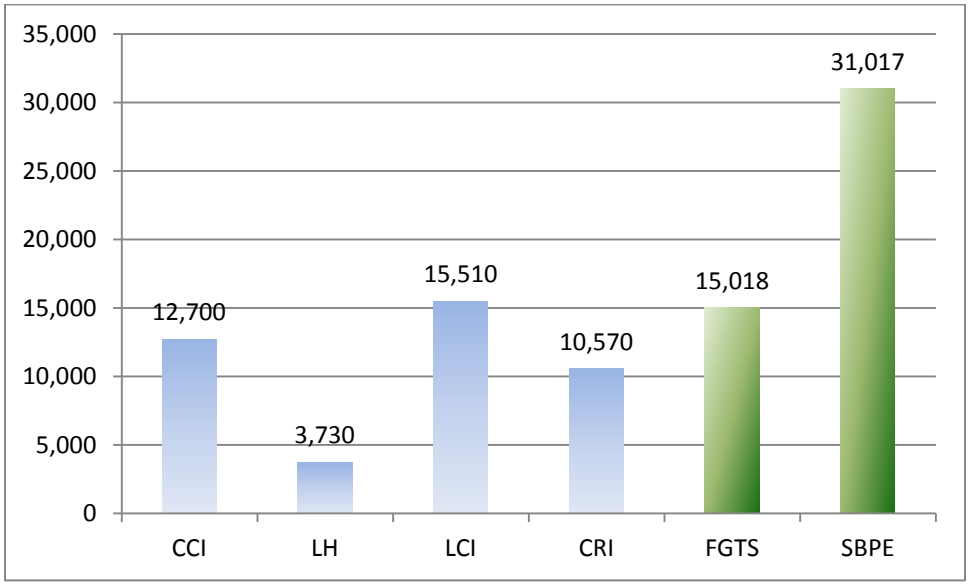
[12] The CCI was created in 2003 for the following reason: historically, the construction industry originated mortgages. Typically, these loans were unsecured obligations of the borrowers that were backed not by a lien on the property but on the individual borrower. The contract under which this loan has been made is known as CCV (contrato de compromisso de compra e venda). The securitization of these types of receivables did not work as the underlying title (or the claim) embedded in the CCV stayed with the developer. This feature limited the ability of the securitization company to recover its investment in cases when the developer entered into bankruptcy. The CCI is intended to bridge this gap.

[13] As there only limited data on these capital market transactions are available, a certain share CCIs may be also covered in the volume of outstanding CRIs.

Banks prefer to issue LCIs due to the embedded flexibility as liquidity management instrument. To calculate the total volume outstanding raised through the capital market, the following should be added: (i) The volume of IPOs from developers amounted to BRL 5.75 billion (as per 2009) and (ii) the volume of closed and open FII funds amounted to approximately BRL 5 billion.[14] Thus, the total volume of all instruments is BRL 53.25 billion. As a comparison, the volume of loans originated within the SFH framework amounted to BRL 49.5 billion (2009).

The numbers should be read with caution: there is a clear separation between the SFH and the SFI system. While the former finances residential mortgages, the latter mainly finances commercial real estate credit. The low importance of CRIs as funding instrument for residential mortgages is underlined by the break-down of funding sources: CRIs account for only 2.6 % of the funding sources of residential mortgages.[15] Despite the importance of the capital market as funding provider in real estate finance, only few funds have been channeled into residential housing finance. Both systems have been only linked through regulatory arbitrage, leading to mismatches of indices and increased exposure to credit risk of SBPE deposits (see details below).

Chart 1. Volume of new issues/new loans (in BRL million as per 2009)



Source: CETIP, ABECIP, CAIXA

2. The market for securitization of real estate credit (or SFI system)

Since their introduction, the volume of outstanding CRI issuances has grown, albeit at a very modest pace. From 1999 to 2007, annual issuance volumes were on average BRL 400m per year. Issuance volumes of CRIs in 2008 amounted to BRL 4.7 billion and in 2009 to BRL 3.8 billion.

[14] Only a certain percentage of these two figures is used to finance residential housing.

[15] The remainder consists of SBPE deposits (about 92 %) and LCIs (about 5 %). See Brazilian Finance & Real Estate/Cibrasec, "ABECIP/SECOVI/Ordem dos Economistas do Brasil, presentation given on 5 August 2010.

According to Cibrasec, more than 90 % of the listed CRIs have been related to inter-bank SBPE regulatory arbitrage (to fulfill the SBPE lending limits). Additionally, banks have benefitted from the 1.2 multiplier allowed by CMN Res. 3347.[16]

The regulatory arbitrage increases risks for both the SFH and the SFI system: (i) a mismatch of indices is the result of the use of different indices for SBPE deposits and CRIs which leads to higher liquidity risk. Additionally, the treasury departments of the banks cannot blend funds from SFH and SFI sources to develop an optimal funding mix for their mortgage loan portfolios; (ii) SBPE depositors are exposed to higher credit risk since their deposits are used to finance developer activities (via CRIs). Since the growth of residential housing finance is primarily based on SBPE sources, the exposure of banks to these risks will augment in the near future.

Typically, CRIs are backed by collateral of real estate loans to homebuilders and real estate development companies. Financial institutions hardly use CRIs to securitize their residential mortgage loan portfolios (less than 5 %, as per 2007).

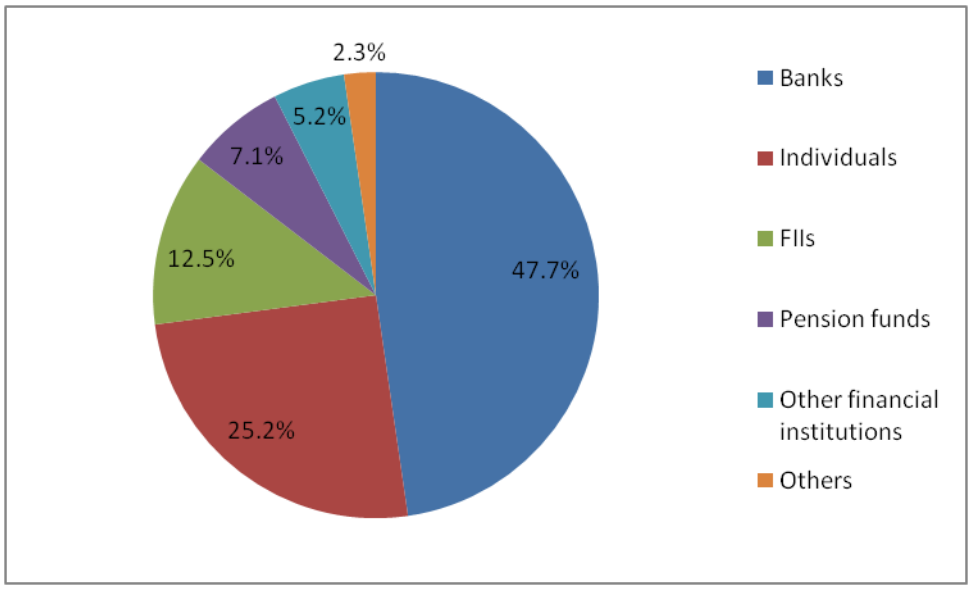
49 securitization companies are registered at the Brazilian Securities Commission or Comissão de Valores Mobiliários (CVM). The market is quite concentrated: 4 securitization companies have a combined market share of 73.7 % (as per 2009). These are Cibrasec, Brazilian Securities and RB Capital and RB Capital Residencial.[17] According to Itau-BBA, the high number of securitization companies is due to the absence of trust structures in Brazilian law. Trusts are the common vehicle for securitization in Anglo-Saxon systems. Securitization companies are exempted from any capital regulations, provided they issue bonds to qualified investors only and a bank does not exercise control over the company. Additionally, there are no minimum qualification requirements for the management of a securitization company.[18]

[16] Because of this multiplier, the calculation of the amount credited towards their regulatory requirement is higher in the case of CRI than in the case of the real estate credits that underlie the same CRIs. This benefit motivates some banks to transform their real estate credits into CRIs, thus becoming investors into these securities.

[17] The two latter securitization companies are owned by RB Capital Holding. RB Capital Holding holds 99.98 % of RB Capital Securitizadora which holds 98.45 % of RB Capital Residencial.

[18] With mortgage lending activities increasing, the Government may want to revisit prudential regulations on securitization companies to ensure that bad risks are not channeled into these companies. The creation of shadow banking system was one of the reasons which lead to the Global Financial Crisis of 2008.

Chart 2. Breakdown of investors into CRIs (2009)



Source: uqbar

Chart 2 shows the break-down of investors in CRIs. The most important investors in CRIs are commercial banks.[19] Regulatory arbitrage is obviously the main driver for banks to buy and hold CRIs. The high holding of individuals is due to the tax exemption of interest income from CRIs. Additionally, individuals can benefit from the tax exemption through the purchase of FIIs which invest in CRIs. It allows investors with less than the minimum of BRL 300,000 to be invested in CRIs.

3. Why is the CRI not used more extensively as a funding instrument for residential housing finance?

Despite the existence of a favorable legal, taxation and institutional framework, the securitization volumes have been quite modest. To date, the dominant funding instruments for housing finance have been FGTS and SBPE. The following reasons explain the dominance of the SFH framework:

Separation of the SFH and SFI system. The SFH system has led to an artificial market which has restricted risk-adjusted pricing of loans and funding instruments. Under the current market conditions, capital market instruments cannot compete with SBPE and FGTS deposits. The SFI system cannot even fulfill its original mandate (to complement the SFH system) because a funding mix of SFI and SHF sources is not possible due to the different indices. The SFH system finances residential mortgages and the SFI system mainly serves to finance commercial real estate credit.

[19] As of 5 August 2010, their share has increased to 63 %.

Lack of standardization and high transaction cost of CRIs issuances. The following elements lead to higher issuance cost of CRIs. Whereas banks pay for SBPE and FGTS deposits TR + 6 and TR + 3 respectively;[20] funding cost for CRI issuances are typically around 300 to 400 basis points greater than SPBE deposits. For example, interest rates on CRIs amount to 94 % of the "Taxa DI over" rate (i.e. as of 20 August 2010, an interest rate of 10.63 % p.a.):

- Difficulties in the assessment of the maturity profiles of CRIs. SBPE deposits have straight cash flows (over TR index) and can be redeemed monthly by investors while CRIs are pass-throughs, the cash flow/maturity profile, or duration of which is hard to assess since borrowers can prepay their loans at any time. Thus, reinvestment risk is passed on to the CRI investor.
- High transaction cost. High issuance cost of CRIs are the result of 1) deal-by-deal registration by the CVM, 2). Typical margins charged by securitization companies are in the range of 2%.

The TR index is not accepted by capital market investors. Investors prefer indices closer to inflation, such as the wholesale price index IGP-M. In 2007, an attempt to issue a CRI based on the TR index failed.

Brazilian capital markets are in their early years of development. According to Cibrasec, 95 % of all CRI issues are private placements. Typically, investors hold CRIs bonds until final maturity - The CRI segment is characterized by limited secondary market trading There is no available benchmarks, etc. The lack of standardization requires investors to assess every individual CRI and the risks related to the underlying assets and the structure. CRIs have not developed into a distinct alternative to government bonds within fixed income securities like covered mortgage bonds in Europe. Most of the CRI issues are not rated.

Lack of investor sophistication and interest. Due to issues with transparency and liquidity, the interest of investors to invest in debt instruments other than government bonds has been so far limited. According to SECOVI,[21] the pension industry for example manages assets worth BRL 514 billion. However, only 2.7 % of its assets are invested in real estate (as per May 2010) although the investment limits would allow holdings of up to 8 % in property and up to 20 % in paper backed by real estate (CVM Resolution 3792).

To date, government bonds have offered a similar return to CRIs or LCIs, but with a lower risk. Additionally, most investors have not built the analytical resources to assess the performance, pre-payment and delinquency risk related to CRIs. As a result, government securities have so far crowded out alternative investment vehicles, such as CRIs or LCIs.

[20] As per 29 July 2010, the TR is 0.1118.

[21] For historical reasons, SECOVI took over the Commission which has been in charge of the promotion of capital markets.

4. Instruments to tap capital markets for funding housing

The next section describes three instruments which could be used to fund housing finance portfolios. Fazenda expressed an interest to learn more about them.

The introduction of covered mortgage bonds in Brazil

A CMB is a debt instrument which is secured against a dynamic pool of specifically identified, eligible mortgages. The fundamental concept of this security is the reliance on the collateral (mortgage) as the primary source of credit quality, which significantly reduces the risk to the bondholder. Mortgage bonds are issued by a bank and usually remain on its balance sheet. The credit quality of the bonds is assured through conservative underwriting standards and strict regulation of loans and lending institutions as well as strict valuation rules.

Fazenda has already received a paper on CMBs which provided an introduction to the main characteristics of the instruments.[22] The objective of this section is therefore to focus on key issues which are considered relevant for the eventual introduction of a CMB regime in Brazil.

CMBs from an investor's perspective

In Europe in particular, CMBs have gained in importance as a funding source in recent years. At the end of 2009, the volume of CMB issuances amounted to EUR 2.39 trillion (about BRL 5.44 trillion). The market for CMBs is the second biggest fixed income market segment after government bonds in Europe. 25 European countries have adopted legislation on CMBs. Covered bond laws outside Europe exist in Turkey, Ukraine, Russia, Armenia, Chile, Uruguay and other countries. As the European market represents the biggest CMB market in the world, European CMB systems and regimes provide useful guidance and benchmarks for the introduction of CMB systems in other countries.

There is no uniform legal and regulatory framework on CMBs in Europe. National legislation differs in terms of types of issuers, rules on valuation of the mortgage cover pool,[23] LTV criteria, and in other areas. To give an example, issuers of CMBs are universal credit institutions (Spain, Portugal, Italy), universal credit institutions with a special license (Germany), specialized credit institutions (Hungary, Finland) or special purpose entities (Spain, Portugal).

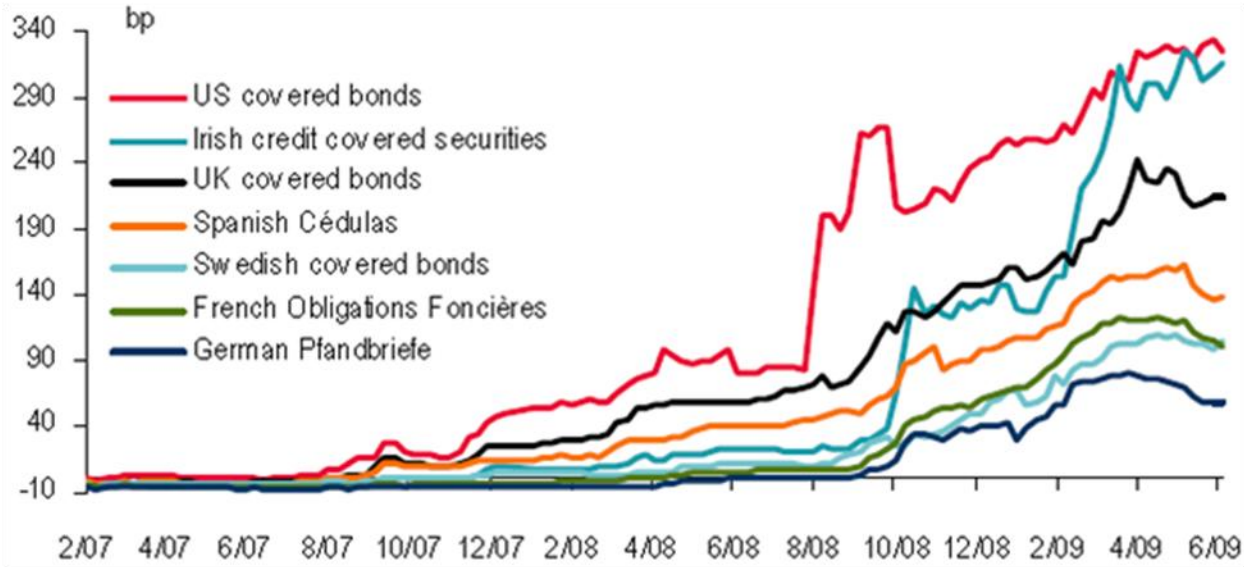
CMBs provide investors with two layers of protection: (i) recourse to the underlying assets (mainly composed of good quality instruments which offer a sufficient degree of over-collateralization) and (ii) recourse to other unsecured assets of the issuing bank. By issuing covered bonds, banks retain the assets on their balance sheets or provide guarantees to dedicated structures to which the assets are transferred.

[22] Bank of America Merrill Lynch, Covered bond primer for the uninitiated, by S. Winkler and A. Batchvarov, 22 January 2010.
[23] The mortgage cover pool includes all mortgage loans which serve as the collateral to back a CMB issue.

According to a recent study published by the European Central Bank (ECB), the evidence of market-based demand in 2010 suggests that transparency, simple and tested structures as well as low collateral risk are key factors for investors; a reputation as a high-quality originator appears to be important as well. For the ECB, this development indicates that investors have learnt some lessons from the crisis; they are now scrutinizing products more carefully, preferring simple and transparent structures.

The perceived higher transparency of CMBs in comparison with senior unsecured bank bonds for example, is mainly the result of the underlying legislation concerning CMBs. The quality of the regulation has a substantial impact on the investor's perception of the risk of the instrument. This feature was prevalent during the crisis when German covered bonds benefitted from tighter spreads than CMBs of other countries due to the tighter standards in the legal and regulatory framework (see chart 3).

Chart 3. Secondary spreads of 5 Year Euro denominated Jumbo covered bonds (mid-swaps) from 02/2007 to 06/2009



Source: Bank of America Securities –Merrill Lynch

Investors also appreciate the market accessibility which is associated with CMBs. Although CMBs suffered between Q4 2008 and early 2009, spreads have tightened and issuance volumes have increased again i.e. investors confidence has been restored. CMBs constitute an important funding tool which is complementary to other funding instruments, such as residential mortgage backed securities (RMBS) or senior unsecured debt.

Covered bond performance between 2008 and 2010

How resilient are CMBs to disturbances in the financial markets? As the experience in Europe has shown, CMBs were affected both in 2008 during the global financial crisis and in 2010 during the European sovereign debt crisis.

Whereas, in 2008, CMBs were affected through rising spreads and lower issuance volumes as a result of investors' flight from real-estate related investments, the difference in spreads among individual CMB issuances also reflected investor concerns about sovereign risk. According to the European Covered Bond Council (ECBC),[24] investors now analyze country risk before deciding on asset classes in which to invest (e.g. CMBs versus government bonds). As a result, strong spread differentiation is visible between CMBs issued in different countries – even between bonds issued by the same bank group, but in different jurisdictions.

The Covered Bond Purchase Program (CBPP) launched by the ECB in May 2009 for a volume of EUR 60 billion (about BRL 136 billion) played an important role in reviving the lethargic CMB primary market in the aftermath of the global financial crisis. The ECB set the major guidelines but left the individual national central banks (NCBs) some room to operate within these boundaries. The ECB and NCBs started to buy CMBs on 6 July 2009 and purchased covered bonds worth €60bn over a 12-month period to the end of June 2010.

As a result of the CBPP, funding conditions for lenders improved. However, it is not clear whether the program contributed to an expansion of lending activities. CBPP contributed to the recovery of the European CMB markets, leading to higher issuance volumes and tighter spreads. The CMB markets were among the first markets to reopen and to offer funding to banks at attractive levels while unsecured markets remained effectively closed in June 2010 (during the European sovereign debt crisis).

The recent change of investors' sentiment has the following implications for the assessment of CMBs in Europe:

- Pricing. Both sovereign risk and the specifics of CMB issue (e.g. LTV limits, covered bond ratings, etc.) will have an impact on pricing.
- CMB issuance. High sovereign volatility could impede CMB issuances. At present, CMB issuers in stable sovereign markets have observed a higher demand for the bond issues. It has allowed them to increase their share of total issuance volumes in Europe.
- Impact of regulatory changes. Ongoing regulatory reforms, notably the Basel III agreement, amendments to the Capital Requirements Directive (CRD)[25] and Solvency II[26], are likely to

[24] ECBC is a platform for exchange of covered bond market participants. It was created by the European Mortgage Federation (EMF) in 2004, a trade association which represents the interests of European mortgage lenders. For more information, please see www.hypo.org.

[25] CRD is one of the pillars of CMB regulations in Europe. It regulates capital adequacy of banks. According to CRD, CMBs benefit from lower credit risk weightings if they comply with certain requirements. The other pillar of regulations on CMBs is Article 52 (4) of the Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS). It sets the criteria, which allows for a special treatment of CMBs. CMBs benefit from this favorable treatment if they comply with certain criteria (e.g. special public supervision, etc.).

[26] Solvency II is a fundamental review of the capital adequacy regime for the European insurance industry. It aims to establish a revised set of EU-wide capital requirements and risk management standards that will replace the current

affect securitization markets in Europe directly and indirectly as they influence the cost of origination. It is expected that future liquidity regulations increase demand for CMBs as they are expected to benefit from a more favorable treatment for liquidity purposes.

Relevant aspects for the introduction of CMBs in Brazil

The following provides a list of questions which are considered relevant to an introduction of CMBs in Brazil. Most likely, further questions will be added to this list along the implementation work of an eventual CMB regime.

- How does any proposed CMB regime fit into the current Brazilian legal and regulatory framework? LCIc/LHs are very similar in design to CMBs. These two instruments are regulated in law 10.931/04. Do these instruments offer the protection similar to CMB regimes in Europe? Would it be sufficient to amend the existing law or does a new law need to be drafted?
- Tax exemptions. Interest income from LCI/LHs is tax exempt (as well as CRIs and SBPE deposits). To ensure a consistent tax treatment between CMBs and other instruments for housing finance, interest income from CMBs should at least be subject to the same tax treatment.
- Which legal and regulatory CMB-framework in another country is an appropriate benchmark or provides adequate guidance for a Brazilian CMB law?
- Which legal and regulatory framework is appropriate to ensure simple and transparent CMB issuances?
- Which areas to be regulated require a special attention in the CMB law? Rating agencies' checklists on the credit risk assessments of CMBs may provide guidance.[27] Topics for attention are over-collateralization, liquidity management, composition of the cover pool (e.g. eligible assets in the cover pool, segregation of the cover pool from other activities of the lender, and others).
- If the Brazilian regulator considers a CMB regime which entitles universal bank institutions to issue CMBs (with or without a license to issue CMBs), the question of structural subordination of existing senior debt like deposits requires closer attention (the proposed CMB legal and regulatory framework may be detrimental to ordinary bank depositors).
- Which changes in the supervisory framework are required to ensure adequate supervision of CMB issues and CMB issuers?
- Assessment of rating agencies on the CMB law.

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solvency requirements. Solvency II is somewhat similar to the banking regulations of the Basel II regime ("Basel for insurers"). If insurance companies invest into CMBs, they have to comply with Solvency II.

[27] See for example: Moody's Investors Service, European Covered Bond Legal Frameworks: Moody's Legal Checklist, published on December 9, 2005.

- What is the view of investors on CMBs? Under what conditions would they be prepared to buy CMBs? Which factors influence their decision and what responses does the CMB regime provide?

Establishment of a fund to buy and sell private securities (fundo de liquidez para titulos privados)

To promote the development of the Brazilian domestic capital market, one idea under discussion within the Government is the establishment of a fund to buy and sell securities. To finance the operations, the fund will rely on equity. According to the current concept, the issuance of debt is not envisaged.

The fund should be established in the form of a private legal personality with state participation of 30%. The state's participation may be raised to a maximum of 49%. However, the conditions of this increase are not defined. The fund will raise funding for its equity from banks, CEF, etc. It is proposed that banks could convert up to 0.1% of the minimum reserves they are required to hold with BACEN into equity in this fund. According to the team's understanding from Fazenda, this fund should have an initial capital of BRL 600m.

One of the main roles of the fund will be to operate as a market maker to facilitate trading in the secondary market.

The proposed structure raises the following questions. They may serve as guidance for any further discussion on this proposal:

- Why does Fazenda propose the establishment of a new institution? It may add a further layer of complexity to a quite well regulated financial sector. For example, the ECB's Covered Bond Purchase Program have been established within an already existing institutional structure. The establishment of such an institution could be a time-consuming process and it might be difficult to wind up this institution once it has fulfilled its mandate.
- Would it not be preferable to concentrate on the development of capital market instruments or products which are typically easier to adjust to changing market conditions?
- Would the proposed size of the fund (BRL 600m) be sufficient to fulfill its purpose? The proposed size may not be sufficient for successful market making.
- Is there any knowledge of the performance of existing market makers? How have they managed their operations? What have been the reasons for their success?
- What is the need for this fund?
- Which safeguards are envisaged to ensure that the fund will not acquire toxic assets (or to avoid the fund developing into a buyer of last resort for toxic assets)?
- How will the fund tackle the issue of correct pricing?

- How would this fund support mortgage market development? It is likely that it faces similar obstacles to its development as already experienced with the SFI system.
- There is a risk that the fund may become the only buyer in the market, which may create difficulties to provide liquidity to the market in the future, especially in a situation where the fund plans to sell securities but no buyer is available (between 2008 – 2010, Sociedad Hipotecaria de Federal (SHF) of Mexico, the task of which is to develop the primary and secondary mortgage market, faced a similar situation).

Liquidity facility as an instrument to propel mortgage market development[28]

A Liquidity Facility (LF) is a financial institution designed to support long-term lending activities by Primary Mortgage Lenders (PML). The core function of a LF is to act as an intermediary between PMLs and the bond market, with the objective of providing long term funds at better rates and under better terms and conditions than individual PMLs might be able to obtain if acting alone. In addition, a LF can provide temporary liquidity support to lenders through collateralized short term operations such as repurchase agreements.

The need for such an institution often arises because of the maturity mismatch between the liabilities and assets of PMLs. Capital market funding is an important way to overcome such mismatches and in some cases it can be the only solution for institutions with small or no deposit bases (non-bank specialized lenders, small banks).

Reasons for the creation of a LF

The following outlines a number of reasons why a LF could be an interesting way to support mortgage market development in Brazil:

- Securing long term funding at attractive rates. Due to lower funding cost, the rates charged to individual borrowers may be lower. Overall affordability is likely to be improved and the range of potential borrowers to be extended.
- Leveraging of existing funding sources. A LF provides access to long-term funding in local currency which allows for better asset-liability management and reduces the dependence on short-term deposits.
- Increasing competition in the primary mortgage market. Lenders, which have previously shied away from mortgage lending, view the LF as an opportunity to enter into this market. Especially smaller lenders which have no access to SBPE or FGTS resources might be interested in such a funding instrument.
- Acting as an intermediate step on the path to a full secondary mortgage market. LFs provide an interim step which connects capital markets to the mortgage markets but with limited

[28] O. Hassler and S. Walley (2007), Mortgage Liquidity Facilities, The World Bank, Washington DC. Available at: http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/Mortgage_Liquidity_Facilities_Hassler&Walley.pdf

complexity or transfers of risks. It provides the long term funds necessary for the market to grow and evolve, and allows time for the growth of the infrastructure necessary for risk transfers to take place.

- Acting to deepen the financial market more generally by providing a long term investment to institutions with long term liabilities. Institutions such as pension funds and insurance companies might be interested in buying mortgage bonds issued by the LF to diversify their investment portfolios.
- Having a tool for delivering policy objectives such as the promotion of affordable housing. If managed carefully a LF can be used to pursue affordable housing objectives without necessarily distorting the objectives of market based pricing. The LF may be able to set specific criteria for the refinancing of loans to particular groups of society such as low income groups or slum dwellers. Balancing these objectives in a way that does not cause market distortion and that does not require large fiscal resources can be very challenging however.

Examples of liquidity facilities

The following countries have implemented LFs:

- Malaysia – Cagamas Berhad. It was created in 1987 as a public/private partnership in which the Central Bank of Malaysia has a 20% stake, and financial institutions, its potential users, 80%. One of the key features of Cagamas has been its willingness to change, adapt and innovate as the market has grown. For a long time, Cagamas offered only one product: the purchase of floating rate mortgages with recourse against the sellers. Starting in 1994 it diversified its services, to include the refinancing of leasing agreements, fixed rate loans and Shariah compliant instruments. In 2004, Cagamas entered the securitization market for the first time. Cagamas had a clear impact on the development of Malaysia's mortgage market. Mortgage loans outstanding grew from RM 20 Billion to RM 183 Billion (about BRL 85 billion) between 1987 and 2005.
- Jordan – Jordan Mortgage Refinancing Company (JMRC). It was established in 1996 with the help of a World Bank loan. It has 16 shareholders from both the public and private sector. In the space of a few years, the number of lenders active in mortgage lending increased from two to ten. Loan maturities more than doubled and are now between 12 and 15 years, with some lenders offering up to 20 years.

Other countries, in which LFs were established, include Malaysia (Cagamas Berhad) Kazakhstan (Kazakh Mortgage Company), Russia (Agency for Housing Mortgage Lending), South Africa (SA Home Loans), the US (Federal Home Loan Banks), France (Caisse de Refinancement de l'Habitat which issues covered mortgage bonds to finance its operations), Mexico (SGF) and Egypt (Egyptian Mortgage Refinance Company).

Guidelines for the establishment of liquidity facilities

The following outlines guidelines for the establishment of a LF:

- Private sector orientation. Any government support during the ramp-up phase of a LF should cease once the LF has reached a level of self-sufficiency. It is therefore recommended that any business plan of LF should outline a clear exit strategy for the government's involvement.
- Sound corporate governance standards. Good governance rules should be cautiously designed to ensure efficiency of the LF and to set an example in the market. The LF should be seen as an entity that addresses a gap in the mortgage and bond market or correct a "market failure", rather as a tool (due to its shareholder composition) exerting undue influence on corporate decisions which may distort the LF's mandate.
- No regulatory exceptions for institutional design but a favorable treatment for LF operations and funding instruments could be considered. The LF's operations should be subject to the same regulatory regime as other financial institutions (e.g. same capital adequacy ratio, same provisioning rules, etc.). Strict regulation and a strong regulator are important in instilling the confidence in the LF that is required by investors, and in preventing "regulatory arbitrage" i.e. participating financial institutions may use the LF to benefit from a looser regulatory set-up for their own operations.

  A favorable treatment could be considered for lenders to use the LF as funding tool and for investors to buy the LF-bonds (e.g. tax exemptions for interest earned on the LF bonds, LF bonds are eligible to be included in the calculation of statutory liquidity ratios required by the central bank) as long as any special regime should not interfere with the sustainability and financial soundness of the LF business model/operations.

  In addition, a LF can include some favorable treatment provided that (i) it is passed on to the users; (ii) it has an economic justification (e.g. a prudent selection of borrowing institutions and quality standards for eligible loans should result in lower risk weight of the LF's assets).
- Clear and transparent sunset arrangements for any preferential treatment. Any design that incorporates some favorable treatment should contain a clear and transparent sunset arrangement which should be communicated to all market participants and stakeholders right from the beginning of the LF's operations.
- Sustainable set-up. Any business plan of a LF should indicate when its operations will become profitable. It should contain strategies in case the breakeven point cannot be reached within the suggested timeframe.
- Strict financing standards. The LF should pursue strict standards and criteria for mortgages being eligible for refinancing or purchase by the LF. In this context, the LF establishes sound financing standards and practices in the market.

- Simplicity. At the beginning of its operations, the LF should stick to simple instruments. It can switch to more sophisticated instruments at a later point once participating financial institutions and investors have gained more confidence in the LF's operations.

Relevant aspects for the introduction of a LF in Brazil

The introduction of a LF in Brazil would raise the following questions. They are aimed at serving as guidance for any further discussion on such an instrument:

- Why should a new housing finance institution be established? Within the FGTS system, CEF has already assumed the function of a second tier lender or LF. To date, no lender other than CEF itself has regularly sought funding from this funding mechanism.
- Might it not be preferable to concentrate on the development of capital market instruments or products which are typically easier to adjust to changing market conditions?
- Would a further instrument be needed to support the promotion of affordable housing? Brazil has already a number of tools at hand probably to achieve the same goals (eg MCMV, FGTS, SBPE, etc.).
- How could the LF support mortgage market development? It is likely that it faces similar obstacles to its development as already experienced with the SFI system.

Rationale for the introduction of covered mortgage bonds

In the past decade, the Brazilian Government has worked on a number of reforms to revive the SBPE and the domestic capital market to support the development of the mortgage market as shown by the attempts to implement the SFI system. The SPBE system is one pillar of the Brazilian Housing Finance System (SFH). Favourable economic conditions have stimulated the growth of SBPE savings and loans. The growth of the FGTS system, the second pillar of the SFH system, has been mainly driven by Minha Casa Minha Vida (MCMV) program which is aimed at stimulating the supply of affordable housing. The stronger demand for loans from both systems cannot be satisfied from the level of savings. It is likely that the system reaches its lending limits by 2013. Interview with lenders already indicate some rationing of SBPE funds.

Despite the efforts of Government and the growth of the housing finance system, low income groups suffer from limited access to housing loans. Lenders have shied away from this segment because of the perceived credit risk associated with low-income people and the lack of long-term funds which would have allowed for longer repayment periods. Caixa Economica Federal (CEF) is probably the only bank which offers housing loans to this segment. However, the institution is understood to have largely exhausted its available funding from the SBPE and the FGTS systems. Typically, lenders have no access to the FGTS system. Lenders, which would have access to FGTS, do not use it because of the complicated rules to obtain funding. Additionally, CEF has already overstretched its capacities to comply with the government targets as set out in the MCMV program.

Capital markets would normally be an additional source of long-finance in local currency. However, the current tools implemented are too expensive for the banks to channel funds into low-income housing finance, or the available maturities are too short to allow for the offer of long-term mortgage loans with a fixed interest rate.

Covered mortgage bonds (CMBs) offer longer maturities and lower funding cost. Both features are poised to stimulate lending to low-income groups. Due to their structure and features, lenders benefit from relatively lower funding cost and longer terms in comparison with other funding instruments (e.g. deposits, senior unsecured debt). Investors into CMBs appreciate the higher transparency and better market accessibility relative to senior unsecured bank bonds which is the result of the legal and regulatory regime for CMBs. These two factors contribute to lower issuance cost. The safety features and the reliability of the instruments are poised to lead to lower credit spreads for borrowers.

In addition, the covered mortgage bond regime implies the application of the strict underwriting criteria to qualify a mortgage loan for inclusion in the cover pool. Though restrictive, this selection mechanism helps avoid the emergence of so-called subprime loans and the emergence of a borrower group which should not take out mortgage loans because its constituents are not capable of repaying. Especially, in a strongly growing economy like Brazil, this feature is likely to be considered helpful to avoid a subprime-crisis event as occurred in the U.S in 2007/08. In a booming economy, lenders tend to loosen underwriting criteria.

The introduction of these instruments has been promoted in other markets beyond Europe, such as Morocco, Turkey, Chile and Uruguay. In Chile, for example, covered bonds are the dominant fixed income instrument in the market and enjoy widespread acceptance. Introduced in 1977, they account for about 50 % of mortgage funding today.

The introduction of covered bonds will contribute to:

1. **The current inability of low income groups to access housing finance**. The aim is to improve access to funding at lower rates, to stimulate competition and, as a result, to lower interest rates for individual borrowers. Low income groups will be the main beneficiaries: (i) longer terms allow for lower loan instalments and (ii) lower interest rates decrease the overall repayment burden. The experience of European countries shows that covered bonds can significantly contribute to the funding of mortgage loans (on average 22% contribution in the EU, and up to 90% contribution in Denmark) and that the issuance of covered bonds can rapidly pick up after the introduction of an enabling framework. Due to the particular structures of covered bonds, funding costs are a small margin over government spreads. In Germany, for example, covered bonds trade at some 50bp over government bonds.

2. **Financial stability by reducing banks' maturity mismatch.** As previously noted, mortgage loans in Brazil are primarily funded by short term deposits which exposes banks to liquidity and interest rate risks. Risk is considerable because a large proportion of mortgage loans carry fixed rates and deposit inflows have been very volatile. Covered bonds typically have a 5 to 10 year

maturity which helps close the maturity mismatch and, as with mortgage loans, offer a fixed rate coupon.

Covered bonds also set the standard for sound loan origination. The mortgage loans eligible as cover assets typically by law have to meet eligibility criteria (e.g. LTV, first lien, performing, etc.) on an ongoing basis and remain on banks' balance sheet (unlike securitization, there is no credit risk transfer).

Covered bonds reduce institutional investors' duration gaps through a class of highly-rated private bonds. Brazilian insurance and pension funds have experienced considerable growth during recent years. According to the Realtors' Syndicate, SECOVI, the pension industry expects an annual inflow of contributions of BRL 17 billion over the next few years. In addition, about BRL 25.7 billion of funds invested in government debt will be repaid next year and some institutions are keen on reducing their high stock market exposure. Even if new government debt issuance remains strong, the institutional investment industry seeks to diversify its bond investments to meet its return objectives while, at the same time matching its long term liabilities requirements.

Due to their multiple credit support - collateral, bank balance sheet, and indirectly government - during the global financial crisis, covered mortgage bonds have fared relatively well even in countries seriously affected by the crisis. For example, while MBS swap spreads in 2009/10 have widened in Spain to some 500bp, covered bonds have done better; they have increased only to some 100-150bp. Covered bonds have become preferred over bank bonds in many economies as bank and sovereign credit ratings declined. Joint issuances of covered bonds by different lenders, as in Switzerland and France, have further stabilized investor perceptions.

3. **Contribution to capital market development**. Covered bonds are the most important privately issued bond segment in Europe's capital market (EUR 2,39 trillion outstanding as of the end of 2009). The Brazilian capital markets are in the early stage of development. Crowding out of corporate bonds by government is still substantial. Steps have only recently been taken to stimulate a market and reduce direct government lending (mostly via the National Bank for Economic and Social Development or BNDES). Unsecured bank bond (debenture) issuance was not permitted before the introduction of letras financieras in 2010. Attempts to tap local capital markets to refinance residential mortgage loan portfolios have failed to date. Typically, domestic bond markets are characterized by limited secondary trading, absence of public ratings, benchmark issues, dominance of government bonds, etc. The issuance of covered bonds contributes to the establishment of favourable conditions for the development of other private debt instruments:

- by increasing the supply of high-quality private sector instruments;
- by greatly facilitating the issuance of long term securities by banks;
- by appealing to a wide range of investor classes, including foreign investors who have been introduced to the concept recently on a global scale;

- by creating a new class of securities, thereby potentially stimulating secondary market activities; and by fostering the use of external ratings in the country.

The following outcomes are expected: through an increased issuance of covered mortgage bonds, an additional expansion of housing finance without banks building excessive liquidity and interest rate exposures will be achieved. Due to longer terms and lower interest rates, access of lower income groups to housing finance will increase.

Annex 2. SBPE – current risk issues and reform options in a changing Brazilian capital market environment

The Brazilian housing finance context

1. Despite strong recent growth, still a small system

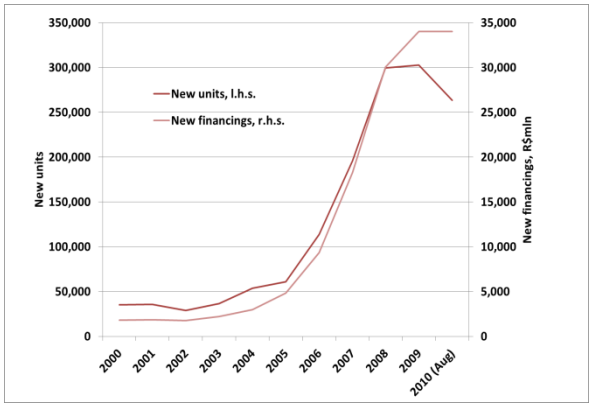
In the past decade, the Brazilian capital market in general and the Sistema Brasileira de Poupanca e Emprestimos (SBPE) in particular have been revived by a sequence of reforms that reduced crowding out by the public sector and lowered the risks for private sector investments.

Reduced inflation in particular has lowered the gap between the SELIC and the deposit rates paid in the SBPE system, TR + 6%, which in turn has stimulated Poupanca savings growth. At present, the SELIC is fixed by the Central Bank at 12 %. A reduction of legacy debt from the FCVS inflation-wage swap system of the 1980s and the reduced legal risk by moving from a mortgage to a deed of trust system ('Alienacao Fiduciaria') have further stimulated loanable funds supply from Poupanca deposits.

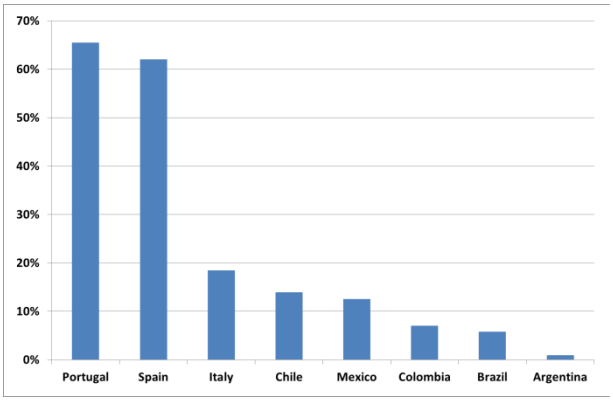
New mortgage originations of the SBPE rose between 2001 and 2009 by 18 times and new construction financed rose by 8 times. With 300,000 new units financed in 2009, construction activity sponsored by the system reached levels last seen in the early 1980s, before hyperinflation had destroyed the system. Together with FGTS, some 540,000 houses were built in 2009 by the housing finance system, up from just 230,000 in 2002.

Figure 2 SBPE: strong recent growth, small in comparison

New mortgage originations and new housing units financed, 2000 – 2010



Brazilian housing finance outstanding to GDP vs. comparators, latest available data



Source: BACEN, World Bank, Finpolconsult computations. Notes: RHS chart: 2009 data, except Mexico (2005), Chile (2006) and Colombia (2007). Brazil: SBPE and FGTS-funded housing combined.

Some house price inflation can be observed in Brazil, as can be inferred from the system's data (see Figure 12 below, there is no official house price index). In 2005, 83% of the SBPE's lending activity was concentrated in the spatially narrow urban markets in the South and South East with 57% of the population. There is a considerable amount of savings deposit transferred into these submarkets from the rest of Brazil.

As Figure 2 shows, the housing finance system is still very small in comparison to benchmarks and finance so far is unlikely to be a significant contributing factor. The recent growth of SBPE has meant an expansion from 2.2% of GDP in 2002 to 4.2% in 2009. Even including FGTS, which has been growing even faster than SBPE in recent years through the "Minha Casa, Minha Vida" program, the scale as of the end of 2009 was still only a moderate 5.8% of GDP. This is under half of the size of Mexico's and Chile's housing finance systems and far below the ratios of Spain and Portugal. In Mexico, the ratio of Mortgages to GDP amounted to 10.9 % and in Chile to 19.7 % (data per 2010).

Some higher price levels should be welcomed to stimulate the volumes of construction needed to seriously attack the Brazilian housing deficit, estimated at 6.3 million houses.[29] As an integrated mortgage capital market does not exist, growth will be self-constrained in the coming years by the current design as a directed credit system relying entirely on deposits (and in the FGTS case, mandatory savings).

2. Which sources of capital: foreing vs. Domestic – institutions vs. households?

Against the background of recent lending dynamics, SBPE lenders fear that the Poupanca funds are being depleted shortly. There are two sources of capital for them outside the savings base: i) foreign capital attracted via the capital account, and ii) the development of a long term domestic capital market via instruments such as mortgage-backed securities or covered bonds.

A third source is the stimulation of faster growth of savings deposits and mobilization of reserves inside the SBPE system, which will be explored below.

Capital inflows

Foreign capital inflows have at least partly driven mortgage market development in comparator countries in Latin America with underdeveloped domestic capital markets in the past. A particular active phase were the 1990s, which saw inter alia strong inflows into the Mexican and Colombian financial systems. Figure 3 shows the empirical correlation between such inflows, the mirror of which being a capital account surplus or current account deficit, and housing finance activity in both countries.[30]

[29] Source: estimate by the Ministry of Cities, based on 2007 IBGE/PNAD data

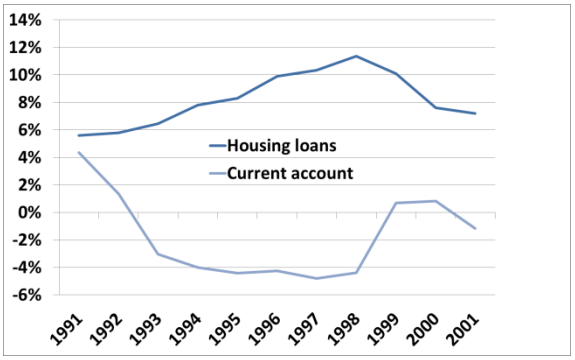
[30] There are a number of potential transmission channels: the real exchange rate of an economy will rise as a result of capital inflows and with it the relative price of non-tradable goods such as housing; a second channel goes via

In the 1990s, most of these capital inflows came in the form of credit provided by large international commercial banks in the interbank market, often encouraged through long phases of managed exchange rates.

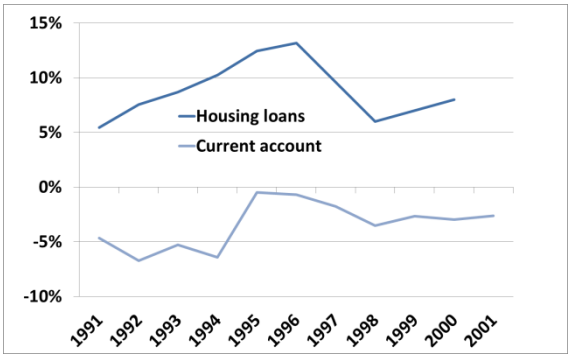
Often, foreign banks use mortgage loan products as a tool to enter the local retail banking market in Latin American countries. Mortgage finance is a bulky investment that allows for the fast buildup of a loan portfolio. It helps to build a retail client base through cross selling.

Figure 3 Current account and housing loan cycles in Latin America – Colombia and Mexico in the 1990s

Colombia 1991 - 2001



Mexico 1991 – 2001



Source: IMF, Finpolconsult computations. Note: % of GDP.

In the Brazilian context with 80% domestically owned housing finance lenders, foreign interbank lending and international bond issuance of both domestic and foreign banks are likely to play an important role. Funding conditions through these channels have to compete against the tax preferences granted for domestic market instruments - savings passbooks and CRIs, as well as the exchange rate risk premium charged by foreign investors. However, cost advantages may arise in some cases from higher ratings of foreign financiers, compared to the Brazilian government (backing passbooks) or mortgage portfolios (backing CRIs), and in particular the short-term nature of such funding.

The dangers of capital account-driven housing finance have by now been amply demonstrated in numerous crisis cases: both the Mexican and Colombian foreign interbank funding experiments ended in crisis, in the Tequila crisis of 1994/95 and the Colombian recession of 1998. In Argentina, substantial foreign investment in the mortgage market helped to keep the currency board alive before it collapsed in 2001. Also in 1998 the Thai housing finance system collapsed saddled by large amounts of foreign currency interbank loans and bonds issued. In the second

declining domestic capital market interest rates that reflect both a reduction in inflation expectations (as a result of the appreciating real exchange rate) and the additional supply of capital; a third channel are direct investments of foreign funds in the housing and housing finance markets through banks and capital markets. Capital inflows via the current account will also sponsor other sectors of the economy than housing, e.g. commercial real estate, infrastructure or corporate investment.

half of the 2000s, a whole series of mortgage market booms and busts caused at least partly by current account imbalances gave rise to a global financial crisis. In the case of the United States, Ireland and Spain, the most important drivers for booming domestic mortgage markets were bonds issued abroad, or – in the case of Central and Eastern Europe – a high share of foreign bank ownership. These lenders channeled excess capital from their home countries to the central and eastern European mortgage markets.

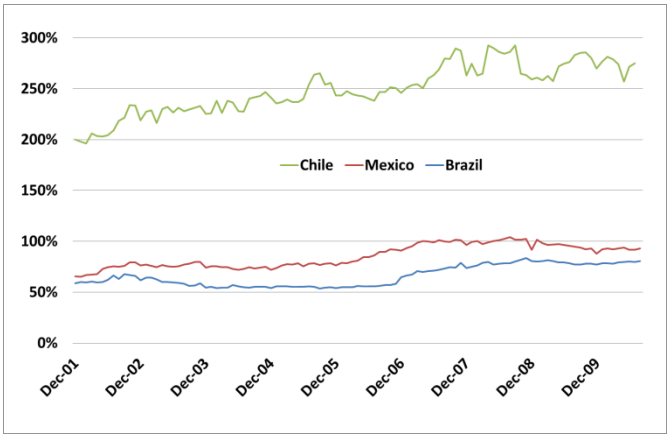
The likelihood that borrowers and foreign financiers alike may ignore those experiences also in Brazil's case is high. It would be useful to closely monitor foreign capital inflows and design mitigation measures if these threaten to become a dominant driver of housing finance liquidity.

Domestic funding sources

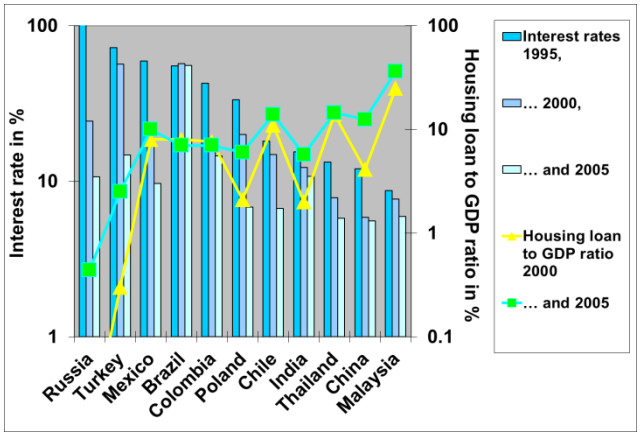
Mortgage markets closely interact with government bond markets via crowding out and in some cases even direct government-imposed growth constraints.[31] The Brazilian situation is a case in point at least for crowding out, as Figure 4 on the right-hand side shows. It demonstrates the interaction between the interest rate compression trend and housing finance growth for a number of emerging markets. The past 10-15 years have seen housing finance systems develop quickly in Russia, Turkey, India and China on the back of strong domestic interest rate compression and disinflation trends. While capital inflows have played a certain role supporting, too, most of the compression trend in the remainder of BRIC and other large emerging markets came from macroeconomic, i.e. fiscal and monetary, stabilization and a deepening of the domestic savings base.

Figure 4: Role of capital markets, interest rate compression in developing mortgage finance

Ratio of private sector claims to deposits in Chile, Mexico and Mexico 2001 – 2009



Interest rate decompression and housing finance system growth in emerging markets 1995 - 2005



Source: International Financial Statistics/IMF, World Bank, Finpolconsult computations.

[31] For example, the Italian government over decades pre-empted the development of a covered bond market in order to increase liquidity for the government bond market.

A number of policy moves can enable a parallel in the footsteps of the before mentioned countries in the Brazilian case:

- Generally, the macroeconomic gross savings and investment ratios in Brazil, with 16.4 and 16.5% respectively, are considered too low. This holds true in the case of the investment ratio both in comparison to other BRIC countries – India's investment to GDP ratio is 40%, China's 50% - and to the median of similarly rated countries of 22.4% (source FitchRatings). Clearly, Brazil needs both higher investment and domestic savings. Housing is just one of many sectors demanding capital. Given the shortage of capital in Brazil and the potential scale of housing investment, there is risk that the sector is left behind by tying it to the current funding mechanisms without any adjustment.

- Any balanced sector development presupposes a further deepening of domestic savings, unless large current account deficits and their macro risks are accepted. This requires a comprehensive development of the institutional and instrument menu for savings and a reduction of forced savings (de-facto taxation) mechanisms that demotivate voluntary formal savings.

- Passbook savings are being stimulated by greater proximity to market interest rates and the expanding branch networks of the banking system. However, lending to the private sector in Brazil will sooner or later outstrip the current bank funding base and in particular savings deposits. As Figure 4 shows, Brazil is already closely following Mexico in absorbing its deposit base. This warrants a strategy to develop the bond market, which the government has also made a priority.

  The most attractive instrument here would be covered bonds. These combine features of corporate and asset-backed bonds and typically have longer maturities than standard corporate bonds. Figure 4 shows Chile's case, which managed to keep the private lending to deposit ratio well above 200% by extensively using bank bonds and in particular covered bonds. In contrast to current cases in Europe, in particular Ireland and Spain, where covered bonds were used to attract foreign capital, Chilean covered bonds have been exclusively funded by the domestic institutional investment industry (in particular life insurers). Covered bonds are potential multi-purpose instruments that in Europe are also generally used to fund commercial real estate and subsovereign credit (example Cedulas Territoriales in Spain).

- **Reduction of crowding out.** Brazil not only recorded a relatively high central government debt compared with BBB rated peers, but also has a high relevance of public corporations and of public bank intermediation. The elevated level of public sector absorption of capital has been criticized as keeping interest rates high and at the same time increasing vulnerability due to lack of borrowing discipline. Current reforms in the corporate bond sector are designed to address these issues partially, e.g. via reducing the corporate loan book of the BNDES, which is consolidated in government debt, and substituting it by direct corporate bond issuance.

It is unclear, however, how much real detachment of this debt from government balances can be achieved, as much of the debt will be seen to be implicitly guaranteed by the government (at least in cases of corporations partly owned). Questions also remain regarding the budget and debt impact of the proposed large infrastructure and social programs, both on federal and state level.

Finally, mortgage banking in the form of Caixa Economica Federal and, more recently, Banco do Brazil remain to a large extent directly on the public sector balance sheet. The role of government-sponsored enterprises Fannie Mae and Freddie Mac in the boom and collapse of the U.S. mortgage finance system posts a warning sign regarding the potential fiscal impact of having to recapitalize such public institutions.

The Brazilian policy decision to avoid large current account deficits is likely to keep interest rates higher than in comparator countries, e.g. Southern Europe or Mexico and Colombia in the 1990s. A combination of stimulation of domestic savings, expansion of the contractual savings industry and the bond market instrument menu can avoid the negative growth implications of that decision and allow housing finance to grow proportionally to overall investment activity.

Deeper domestic capital markets would be favorable for the stability of the financial sector and the preferable source for funding future housing loan portfolio growth. Their development would imply a further strengthening of securitization and bank bond markets, which should be able to target groups of investors with differing cash flow structures and credit enhancement features. The Brazilian pension fund industry for example is at present highly exposed to government bonds and stocks and funds are keen on diversifying their portfolios.

In view of the development of financing instruments for housing finance, covered mortgage bonds (CMB) could complement the current corporate bond instrument menu by offering long-term investment opportunities to investors. They allow channeling long term funds at low cost to housing. CMBs could improve the risk-return profile of the Brazilian pension industry by altering its portfolio composition and facilitate the exit from an investment strategy biased towards stocks and sovereign bond holdings.

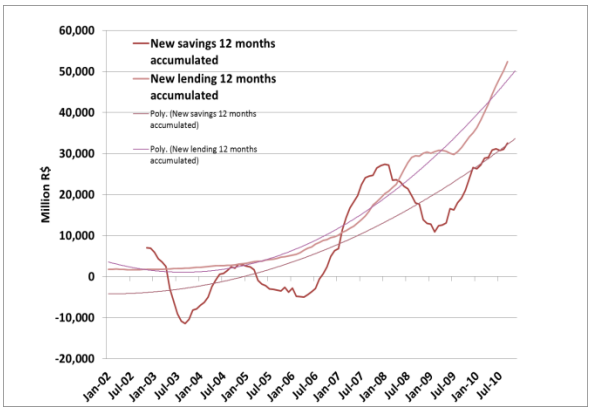
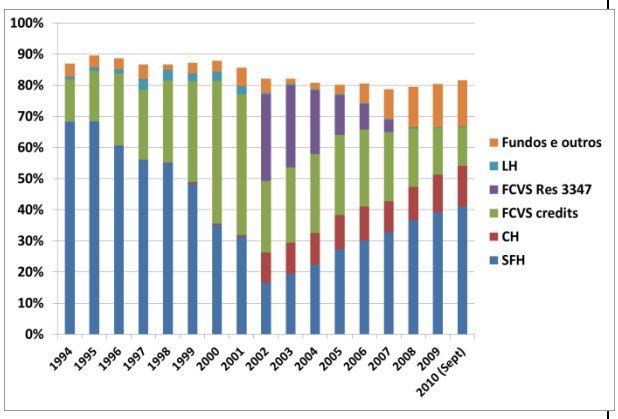
SBPE: exposure to liquidity and interest rate risk

3. System growth and liquidity constraints

Figure 5 demonstrates on the left side a high growth of new SBPE savings ('captacao liquida') and new housing lending ('valores financiados'), with recent annual growth rates of 70% and 66.7% respectively (October 2010-November 2009 over October 2009-November 2008). This would suggest new savings currently slightly outperforming new lending.

Outstanding Poupanca savings, however, have grown by much less - in the quarter of August-October 2010 over by only 19.4% over the quarter of August-October 2009. The key driver is that the inflow of new savings is quite volatile. In 2008 and the first half of 2009 the inflow of new savigns declined. One main resons is the interaction with the development of the SELIC.

Figure 5 SBPE deposit and lending dynamics, gap and liquidity reserves

12-months accumulated new savings and new housing lending, 2002 – 2010 (October)	Housing lending and other eligible uses of SBPE resources, 1994 – 2010 (September)
	

Source: BACEN. Notes: SFH – Sistema Financeiro Habitacional. CH – Carteira Hipotecaria. FCVS – Fundo de Compensação de Variações Salariais/. LH – Letras Hipotecarias.

More importantly, the level of new lending has remained considerably higher than the level of new savings: for example, while in the quarter of August-October 2010 BRL 7.1 billion in new savings were attracted, almost BRL 16.0 billion in new lending was granted. Apart from short spells, this gap has now been present for the entire past decade. Figure 5 on the left hand side shows that lending dynamics in late 2008 and early 2009 got seriously impaired by a shortage of new deposits, and a slow-down may be expected again as a result of a widening gap soon.

The right-hand chart in Figure 5 demonstrates that the difference between the inflow of new savings and new lending has been so far 'financed' by a reduction of non-housing loan assets in the SBPE balance sheet. The reduction is entirely due to loans and bonds issued by the FCVS,

the wage-price index swap mechanism of the 1980s that left behind considerable levels of government-insured legacy debt held by lenders.

How fast will the system hit the liquidity wall?

- The SBPE lender trade group ABECIP has forecasted in the summer of 2010 that new loan originations will quintuple from an expected BRL 50 billion in 2010 (which was already surpassed in the 12 months prior to October 2010, with an accumulated BRL 52.3 billion) to over BRL 250 billion in 2014. This would mean a 50% cumulative annual growth rate and be broadly in line with the long-term growth rate of new lending since 2002.

  Clearly, the substantial gap between the Brazilian and comparator housing finance system size and the current Brazilian economic growth context would support such high new lending growth, even when more elevated interest rates than what the SBPE system offers are being assumed.

- However, outstanding mortgage loans have grown less, between 30 and 37% in the past two years, due to fast amortizations under the predominant serial amortization scheme (see below) and given the absence of negative amortization resulting from low levels of TR. Even when some reinflation is assumed, a 40% growth rate portfolio growth rate until 2014 seems more realistic than extrapolating current growth on the margin.

- SBPE deposits will likely grow slower, still. A simple interpolation as shown in Figure 5 produces a long-term growth rate of approx 20%, matching roughly the change in outstandings. Assuming that the SBPE – SELIC gap will remain small, it appears apporpirate to assume that a growth rate of 25% could be achieved (see also Figure 6 below). Taking the data indicated, these figures suggest that lending limit of 65 % of SBPE deposits (per September 2010 44.2%) will be reached by the end of 2013**.**

  However, a widening SBPE – SELIC gap might produce a far earlier threshold point: it will result in faster loan growth combined with slower savings growth. We present two scenarios below.

Interviews with lenders indicate that already some rationing can be observed today. Essentially all lenders operating in the urban growth centers in the South-East as well as Caixa are concerned about deposit depletion in the short run. Not rationed so far appear to be lenders with rural and Northern operations. There is consequently some North-South transfer of deposits going on, for example via Banco do Brazil capturing deposits in the North to its subsidiary Nossa Caixa in the South.

4. Mobilizing liquidity reserves

A strategy to mobilize liquidity reserves inside SBPE could buy a few more years of SFH funds, by either limiting the growth, or winding down, non-SFH uses of liquidity.

- The category of ’fundos e outros’ could be reduced, or at least its growth of currently 38% p.a. be curbed. This category currently includes investments of SBPE deposits into CRIs, LCIs or other debt instruments. It would preferable if these investments were funded by investors directly and not by the savings bank system. CRIs for example mostly finance short-term developer receivables and potentially increase credit risk for SBPE deposit holders as developers loans are considered more risky than mortgage loans to private households.
- The mortgage portfolio invested outside SFH limits, the Carteira Hipotecaria, could similarly be reduced or its growth be curbed in favor of more SFH lending.
- BACEN could also consider reducing central bank reserves of BRL 56.7 billion (September 2010) or 18.5% of SBPE deposits.

In total, reducing government claims, the minimum reserve requirement of 20 % and/or cross-subsidies to private sector issuers of CRIs could buy the system some 2-3 years of additional time. This could push the deposit depletion point in time into the second half of the current decade. Estimates under two scenarios will be presented below.

5. Interest-rate elasticity of SBPE deposits

While additional measures to mobilize liquidity could be supportive in the short-term, the key driver of liquidity will be the dynamics of inflows of new savings. A return even to negative growth as still seen in the middle of the 2000s could pose significant liquidity risk to the system unless lenders are capable of accessing other funds to close any liquidity gaps.

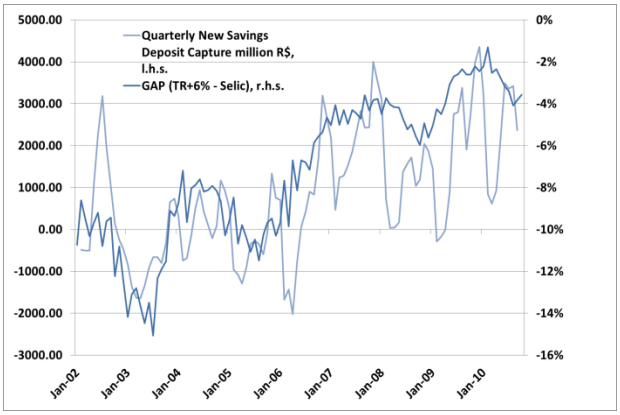
A considerable share of core deposits within SBPE deposits would facilitate liquidity management of lenders. The central question therefore is whether SBPE deposits are ’core’ or ’opportunistic’ deposits. Interviewed lenders consider Poupanca deposits to a large extent stable, i.e. core deposits with limited interest elasticity. Lenders quote ratios between 40 and 60%.

The fact that Poupanca deposits can be drawn down for current account purposes, such as direct debit cards and current payments, speaks in favor of a core deposit interpretation. So does the strong market penetration (there are 93.4 million savings accounts in a population of 190 million), including in rural areas with limited alternative investment options. The tax exemption of the return on SBPE deposits could be viewed as another reason, although differences to other non-exempted instruments are broadly reflected in yield levels.

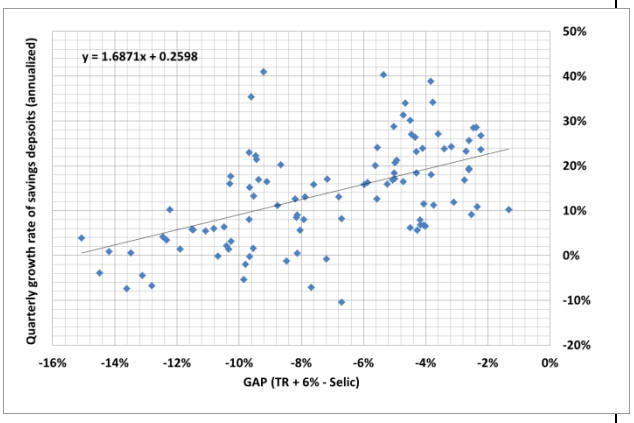
However, SBPE deposits could be called daily and the 6% interest rate is applied regardless of the holding period. A 3-month minimum holding period was removed during the high inflation phase in the mid-80s and has never been reinstated after inflation dropped. Income from interest on SPBE deposits is tax exempt irrespective of the amount deposited and the holding period. All these elements make SBPE deposits volatile.

Figure 6: Government bond – savings passbook return gap drives savings deposit liquidity

SBPE - SELIC(+ 6%) gap and new savings deposits capture, 2002 – 2010 (October)



SBPE - SELIC(+ 6%) gap and new savings deposits growth rate, 2002 – 2010 (October)



Source: Abecip, Bacen, Finpolconsult computations,. Notes: Centered 3-month moving average of new savings deposits captured; SBPE only.

In June 2010, about 2.5% of the SBPE deposit holders hold about 60 % of the total SBPE deposits. It is likely that some of the SBPE deposit holders would be interested in longer-term debt securities. The concentration of SPBE deposits within a smaller number of investors has nearly doubled since 2002.[32]

The new Poupanca saving inflows are empirically found to be highly interest-elastic. The type of currency used, TR, and fixed 'real' interest rates necessary mismatch with both inflation and capital market conditions (see Figure 8 below). The inflation compression trend of the past decade in Brazil has mitigated such mismatch risk, but not eliminated it. Figure 6 clearly demonstrates that while growth is now positive and thus immediate threats of illiquidity are less relevant, its dynamics depends on the SPBE – SELIC gap.

The fall of the Inflation rate has ensured the return of Poupanca rates into slightly positive or zero real interest rate territory (if measured against IPCA on a year-on-year basis). A related exogenous factor was the parallel decline in Selic government bond yields. The absence of a tax exemption for government bond interest payments allows for narrowing the gap up to the withholding tax level of 15%. Below that level, strong inflows into SBPE deposits can be expected. The convergence of the gap between SPBE deposit rate and the SELIC in a declining interest rate environment is accelerated by the construction of TR (see Figure 8 and discussion below).

[32] Only 6 % of SPBE deposits are held by legal entities ("pessoas juridicas"). However, no information is available whether there is a concentration of investors among legal entities. It is not clear why these entities invest in SBPE deposits as they do not benefit from the same regulations on tax exemptions as private individuals.

Figure 6 on the r.h.s. highlights the relation between the narrowing gap to Brazilian government debt and the growth rate of savings deposits in a different way. It can be concluded that **any 1%** absolute increase in the SBPE – SELIC gap cuts back the growth rate of savings by 1.5-2%. In early 2003, with a 13% gap, savings contracted by 7%. When the gap closed to a few percentage points as in the last three years, basically reflecting the tax effect, growth increased to 15-25%.

6. Liquidity forecast considering the SBPE – SELIC gap

Table 1 Poupanca vs. SFH lending dynamics and 65% threshold in low and high Selic rate gap scenarios

	Scenario low Selic gap			Scenario high Selic gap		
	Gap	1%		Gap	3%	
	Poupanca	SFH loans		Poupanca	SFH loans	
Growth p.a.	25.0%	35.0%		20.0%	40.0%	
(September)	billion R$		Ratio	billion R$		Ratio
2010	284.97	125.87	44.2%	284.97	125.87	44.2%
2011	356.21	169.92	47.7%	341.96	176.22	51.5%
2012	445.27	229.40	51.5%	410.36	246.71	60.1%
2013	556.58	309.69	55.6%	492.43	345.39	70.1%
2014	695.73	418.08	60.1%	590.91	483.54	81.8%
2015	869.66	564.41	64.9%	709.10	676.96	95.5%
2016	1087.07	761.95	70.1%	850.92	947.74	111.4%

Source: BACEN, Finpolconsult computations. Notes: 2010 September lending/savings data actuals.

The recent liquidity growth can thus easily be short-lived, e.g. if the SBPE – SELIC gap widens again because of strong public investment or general growth. Already a slow-down in savings dynamics is observed over the fall of 2010.

When inflation or growth rises, the gap increases in excess of proportion to the Selic rate increase as a result of the TR 'redutor', which means that the housing finance system's liquidity falls behind.

There is reversely a substantial risk of excess liquidity if Selic rates continue their long-term downward trend while deposit rates remain fixed. This could force SBPE lenders to violate investment floors in housing (absent demand) or reject growth opportunities (attracting new deposits).

While poupanca growth increases with a declining SBPE – SELIC gap, the growth rate of housing lending should respond in reverse. This is because alternative funding mechanisms via the capital markets will become more attractive if the gap narrows. While the catch-up growth of the small system probably overlays such effects for the time being, it is nevertheless worthwhile to consider its potential impact. Table 1 presents our assessment of the two most likely scenarios: if the SBPE - SELIC-gap remains small, the 65% legal threshold limit should be reached – on aggregate – by 2015 only. If the gap rises, it could be reached as early as 2013.

Reducing and permanently limiting the SBPE - SELIC gap could significantly reduce the high volatility of Poupanca deposit inflows and thereby mitigate SBPE liquidity risk.

Under the benign macroeconomic conditions prevailing both the indexation and interest rate risk protection method should be changed to a system that is closer to market conditions. Either the

TR construction should be changed, or a new index closer to the market or an exit to nominal Real lending should be sought. This issue will be further explored below.

7. Maturity transformation risk is acute

The SBPE funds housing loans that are prepayable by the borrower at any time with deposits that cannot be prepaid by the bank, but can be withdrawn by savers at short notice. Figure 7 shows the extent of the maturity transformation risk associated with this asymmetric contract design:

- If interest rates fall (left-hand table), this means that liabilities (deposits) will extend and assets will reduce their duration. Deposits that would otherwise be called for to seek more attractive investments will stay in the system, while borrowers will seek lower interest rate loans. The result is large negative maturity transformation risk – i.e. significant losses as banks keep expensive funding for too long.

  There is a certain protection against this risk in the Brazilian context due to the considerable legal transaction costs of refinancing from one to another lender. However, lenders already report prepayment rates of between 3% and 6% p.a. for their mortgage portfolios and competition between lenders is increasing. Hence the often met assumption that borrowers would not react to interest rate changes seems implausible.

  On the liability side, given the legal situation, lenders are wholly unprotected against extension risk of the 6% interest rate deposit accounts. The law does not allow lenders to modify the interest rate or return deposits to savers, or even refuse to accept new deposits.

  If passbook rates cannot be adjusted legally downwards and the volumes of potentially high-rate deposits cannot be controlled, the necessary consequence will be a search for higher risk assets offering higher returns by lenders (including more risky mortgage loans) to compensate for tight or negative margins on low-risk assets. This might lead to insolvency, as the example of the U.S. savings and loan industry shows.

Figure 7 Maturity transformation risk in the SBPE caused by legal features of loans and deposits

Negative maturity transformation risk caused by mortgage prepayments and non-callability of 6% deposits by the bank

Scenario: Interest rate compression (drop from 6% to 4%)

Impact: Asset duration will fall (early repayments), deposit duration will rise

Assets			Liabilities		
Share	Duration	Type	Type	Duration	Share
76%	2.5	Mortgage	Deposits	5	95%
24%	1	Other loans	Capital		5%

LDG = -2.61 years -->negative maturity transformation risk

Change in capital ratio -98%

Positive maturity transformation risk caused by extension of mortgages and daily withdrawal option of 6% deposits by savers

Scenario: Interest rate shock (rise from 6% to 8%)

Impact: Asset duration will rise, deposit duration will fall (withdrawals)

Assets			Liabilities		
Share	Duration	Type	Type	Duration	Share
76%	5	Mortgage	Deposits	2.5	95%
24%	1	Other loans	Capital		5%

LDG = 1.67 years -->positive maturity transformation risk

Change in capital ratio -63%

Source: Finpolconsult computations. Notes: Durations expressed in years. LDG – leveraged duration gap.

- Vice versa, if interest rates rates rise (right-hand table), liabilities (deposits) will reduce and assets will extend their duration. Deposits, as we have seen, are interest rate elastic, and the lender might have to substitute 6% deposits by higher interest rate funding sources to roll over the existing mortgage portfolio. Prepayments will almost come to a halt, they remain limited to 'non-financial' motives, such as a move of house due to job change. This structure means large positive maturity transformation risk.

  Already, Brazilian mortgages feature minimal margins, which we discuss briefly below. Rising funding cost would eliminate these and lead to losses. Here the question of the scale of core deposits becomes decisive – whether just 50% or 70% of deposits would roll over. In any case it would be preferable to have issued a long-term instrument reducing positive maturity transformation risk.

  Reducing maturity transformation risk is the objective of Basel III considerations regarding the so-called 'Net Stable Funding Ratio'. This ratio stipulates that assets with duration exceeding 1 year should be covered by liabilities with duration exceeding 1 year. In the context of the Basle III framework, deposits are considered short-term instruments. This assumption may not be appropriate in the Brazilian case given the considerable core deposit ratio of SBPE deposits.

Both scenarios are of concern regarding the solvency of lenders, as the application of the classic leverage duration gap formula in Figure 7 shows. A specialized lender could quickly decapitalize, in the Brazilian context of larger universal banks running moderate SBPE portfolios, the result would be mitigated, but has still an impact on the balance sheets.

We conclude that two central legal changes could mitigate the solvency risk in the short-term:

- Lenders should be entitled to adjust the interest rate on the SPBE deposits to manage negative maturity transformation risk. A lowering of deposit rates or of the deposit-loan rate band could be part of broader exit considerations (see below).

- Legal transaction cost for loan prepayments should be lowered; however, lenders should in exchange receive the right to charge prepayment indemnities proportional to their actual reinvestment loss, at least for some period (e.g. 5 years). This is currently a legal option inter alia in Spain and Chile (see Table 2).

  Reducing legal cost would enhance competition for borrowers and put prepayment pricing into the hands of the market, instead of the government. Banks could offer lower interest rates for loans carrying indemnities, which enable an easier matching over mid-term instruments, such as term deposits, debentures, or covered bonds.

  If indemnities are set to zero, loans will carry prepayment option cost and in exchange consumers can take full advantage of an interest rate decline. The prepayment option is already embedded in current pricing conditions, however, it makes Brazilian loans more expensive (assuming U.S. pricing conditions by some 0.7-1%). Ideally, different types of borrowers would self-select between (sufficiently safe) products rather than being forced to a single product.

8. Margin contraction poses additional risk

According to industry estimates received on earlier missions a gross margin of 4% needs to be obtained to cover operational costs of mortgage lending and maintain a return on equity after tax that basically matches government bond yields (after considering leverage).

Margins already dropped below that level, with typical interest rates between 8.5 and 9% over TR and deposit rates remunerating 6% over TR. They could come under further pressure in a declining interest rate environment due to greater capital inflows in non-SBPE channels, or due to more intensive competition. Many European banks, for example, see mortgage finance as an entry product to cross-sell additional loans or insurance products, and as a consequence originate mortgages at non-cost covering pricing.

Considering a realistic gross margins in the 2% range, SBPE lenders will have severe profitability problems:

- Loan administration costs for loans in Brazil are safely above 0.5%. The main reason is lack of scale: the largest portfolio administered outside Caixa comprises only 10,000 loans.
- Increasing competition will force more of the currently high loan origination costs (ca 4%) to be financed over the margin, which reduces the net margin (profit) by 0.2-0.3%.
- This leaves less than 1.3% left with most lenders for covering the still considerable risks of mortgage lending as well as capital cost. The risks include in particular prepayment risk – which in the US and Denmark, where capital market instruments allow for a measurement, can be shown to cost approx 0.7% -, and credit risk, for which a margin of 0.2-0.4% appears to be the minimum.

- Profits in this context are under pressure. Assuming 0.3% net margin from lending and a capital ratio of 4%, return on equity would be below 8%.

Margins are less likely to fall in a scenario of increasing interest rates. However, in such a scenario, a decline in liquidity is likely due to a widening SBPE - SELIC gap and deposit withdrawals.

In conclusion, margin risk is adding pressure to change the legal options for lenders to alter deposits interest rates in the most likely scenario of declining rates. Reducing the deposit rates on SBPE deposits would allow lenders to improve margins and avoid losses from negative maturity transformation.

As already mentioned above, the interest rate regime of the SBPE system exposes lenders to considerable liquidity risk. Especially the floor of TR + 6 % on deposits increases the exposure to interest rate risk when market interest rates fall below this floor. This risk varies with the size of the non-SBPE portfolio of the banks. Smaller banks are understood to be more exposed to this risk. To improve interest rate risk management, it is recommended that lenders should be allowed to adjust SBPE deposits below the current floor.

To improve liquidity risk management, long-term deposits should be preferred over short-term deposits. For example, the previously existing 3-month minimum holding period for SBPE deposits could be reinstated. It was cancelled in the mid-1980s during a period of high inflation.

Another measure is to differentiate the remuneration of SBPE deposits by the holding period. Shorter holding periods should bear a lower interest rate and longer holding periods should be rewarded with a higher return on deposits.

If Government still wished to maintain a certain floor of the SBPE deposit rate, it could replace the floor by a band within which SBPE deposits would be allowed to fluctuate. Within this band, lenders would be allowed to adjust the SBPE deposit rate. Such a policy could nurture product innovation and allow lenders to manage better any spread compression.

Selection of indexation instruments and transition to nominal lending

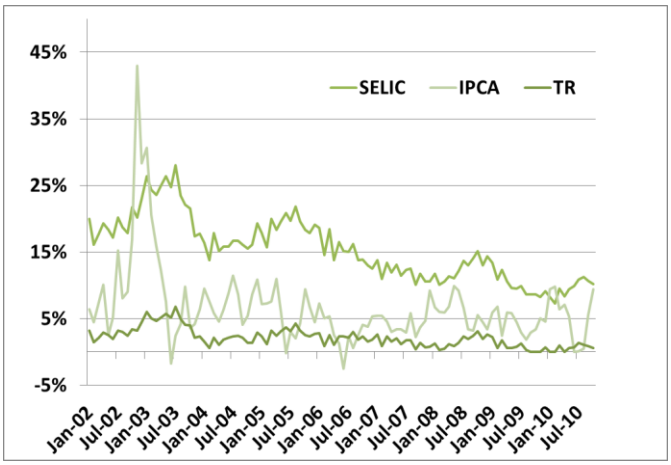
9. Type of index: bank funding cost vs. inflation

In Brazil, two types of indices dominate: (i) indices based on banks' cost of funds and (ii) indices linked to inflation. Both types of indices have a different impact on credit risk and cost of funds. To facilitate the blending of different funding sources, lenders would prefer the abolition of the TR or at least an alignment of the TR construction to indices used in connection with other funding instruments.[33]

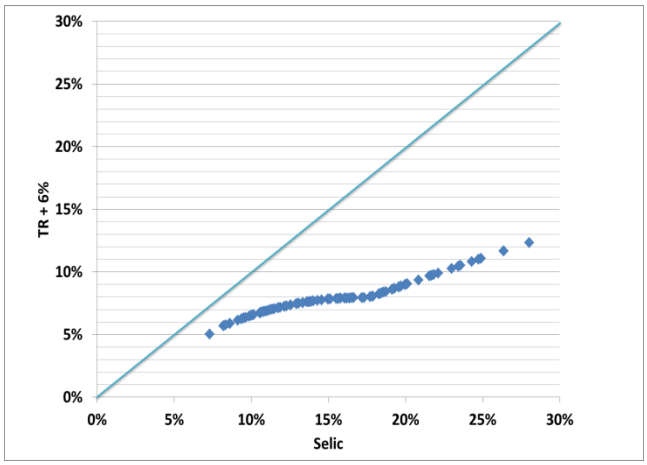
TR is a modified bank cost of fund index. It is computed under a formula that transforms the Brazilian basic capital market reference rate Taxa Basica Financiera (TBF). TBF is the average interest rate offered by 30 banks for their 30-day certificates of deposits, adjusted for a (varying) factor representing tax effects.The TR formula essentially dampens the impact of an acceleration of market interest rates on mortgage rates. Figure 8 on the right-hand side demonstrates the effect against the government bond rate SELIC, a close substitute of the TBF. Clearly, the purpose of the introduction of the TR in 1992, during the hyperinflation phase, was to insulate the mortgage credit market from the interest rate and inflation shocks prevailing at the time. This motivation has largely ceased to exist.

Figure 8: Taxa referencial (TR), inflation and capital market benchmark - January 2002 – October 2010

Annualized monthly changes, TR and benchmarks



Shock absorbing mechanics of TR (vs Selic)



Source: BACEN, Finpolconsult computations.

[33] For an overview about the different indices used in Brazil, please see "Banco Central do Brasil: Price Indices", August 2006,

The TR is therefore seen as an anachronism. It is moreover rejected by capital market investors in Brazil due to its recently strong underperformance against inflation (see Figure 8, left-hand side). An appropriate inflation index could be the national consumer price index IPCA (Indice de Precos ao Consumidor Amplo). IPCA is widely held to be an appropriate potential substitute for the TR in the mortgage market and will therefore be used for this analysis as a benchmark. A key reason for the market leaning towards IPCA is that the index has been less volatile than other inflation measures in the past decade, limiting potential credit risk. This holds true in particular if compared with the wholesale price index IGP-M (Indice Geral de Precos do Mercado) that is widely used in CRI securitizations.[34]

Reviewing the index history of the past decade, TR indeed has risen far less than IPCA. For example, setting the base for both indices per January 2002 at 100, TR in October 2010 stood at 119.65 and IPCA at 172.78. Average consumer price inflation hovers around 5% while TR has gone to zero. Also, the volatility of IPCA, although lower than that of other inflation indices, has been higher than that of TR with its stabilizing construction mechanism.

If a positive differential also is reflected in future expectations for both indices, this implies that rates (juros) under CPI-based lending will be lower to arrive at the same internal rate of return (IRR) of the loan than under TR lending. For example:

- A TR+9% loan originated in January 2002 and prepaid in October 2010 would have generated an IRR of approx. 12% p.a. nominally.

  A second loan formulated as IPCA + 9% would have generated an IRR of 17.25%.

  In order to generate the same return as the TR loan, hence, in hindsight the interest rate on the IPCA loan should have been only 4.6%, i.e. 4.4% lower than on the TR loan.

- However, if we consider the same two loans originated in December 2005 and prepaid in October 2010, the interest rate differential necessary to obtain the same IRR would have declined to 2.95%.

The example already demonstrates the difficulty of operating both contracts in parallel, as lenders need to forecast the development of both indices. At present, quotes on interest rates using IPCA are in the range of 6%, which also reflect recent index differentials. These quotes are not lower than 4.6 % which reflect a longer term differential calculated and is possibly more accurate for a long-term mortgage loan. Obviously, thus, with rates fixed in advance, a spike in inflation such as the one of the summer of 2002/3 that pushed IPCA up while leaving TR almost unaffected could drive up costs for borrowers substantially. If one stuck to the TR, this would not happen. Both borrowers and lenders face considerable uncertainty.

[34] IPCA is issued by the public, Brasilia-based Brazilian Institute for Geography and Statistics, IBGE, while IGP-M is issued by the private, Sao Paulo-based Fundacao Getulio Vargas, FGV. We do not go into further detail of great variety of inflation indices and their construction methodologies in Brazil since the main purpose of the analysis is to compare the performance of the main classes of indices.

It should be noted here that the reverse risk of a faster rising TR index is also possible as the history in the 1990s both in Brazil and comparator countries demonstrates. The TR shock in Brazil in the summer of 1993/4 had led to escalating defaults and prompted BACEN to introduce a correction factor (see below).

The failure of a local version of TR in Colombia holds particularly important lessons for Brazil: the Unidad de Poder Adquisitivo Constante (UPAC) was similarly formulated as TR, in the last version as a fixed percentage (74%) of the mean of short-term bank interest rates in the last 12 weeks. The system already had been introduced in 1972 and survived long phases of moderate, but not very volatile, inflation in a basically closed domestic capital market.

In the mid-1990s considerable capital inflows into the Colombian market depressed UPAC, leading to a massive housing finance boom.[35] Interest rates became contracted, house prices steeply rose. Loan-to-value ratios also increased as accelerating prices met limited downpayment capacity of borrowers. When the bubble collapsed in 1999, the capital inflows instantaneously reversed. Many homeowners came into a negative equity position, unemployment soared and UPAC grew considerably faster than inflation. In 1999, a Supreme Court judgment ruled the use of UPAC unlawful and forced the government to return to inflation indexing. Not enough with this: all loans originated since 1993, the last major change to the UPAC undertaken by government, had to be reindexed with inflation, which imposed major losses on mortgage lenders.

[35] The definition of the UPAC index, created in 1972, changed several times, but most drastically when it was linked to interest rates on short term deposits in 1994. These rates increased at a pace faster than inflation, culminating in 1998 at a level that triggered a surge of NPL = 25% of mortgage loans outstanding at the end of 2002- , which led to a fall of housing prices and initiated a crisis that spread to the whole financial system.

Table 2 Mortgage indexation in comparator countries				
	Chile	**Colombia**	**Mexico**	**Spain**
Index name, used since	Unidad de Fomento (UF), 1967 – today	Unidad de Valor Real (UVR), 1999 – today	Unidad de Inversion (UDI): 1995- today Minimum wage (SM): 1995 - today (earlier versions) Tasa de Interes Interbancario de Equilibrio (TIIE): 1997 – today	Euribor, 4 other indices: 1994 – today
Type of index	CPI inflation	CPI inflation	CPI inflation Minimum wage Interbank rates	Interbank rates (other indices also reflect bank cost of funds)
Replacing, crisis event	n.a. No crisis event	Short-term bank deposit rate index. 1999 crisis	Nominal peso lending indexed to government bond rates (high-income). Dual-indexed lending with payment due index linked to government bond rates (low-income). 1994/5 crisis.	Nominal Pesetas fixed-rate lending < 1994. 1992/3 crisis. Main motivation was pass-through of declining European rates to pump-prime the Spanish economy.
Types of loans, market shares	PLAM (UF): 100%	PLAM (UVR): 10% Nominal Peso (FRM): 90%	PLAM (SM, lenders protected by gov-sponsored SM-UDI index swap): 70% PLAM (UDI): 7%. Nominal Peso (FRM & ARM, tied to TIIE): 22%, most of which FRM	Nominal Euro (ARM, Euribor):>95% Other ARM indices irrelevant. Nominal Euro (FRM): ~3%
Current index computation method	CPI inflation of the preceding month, not seasonally adjusted.	CPI inflation of the preceding month, not seasonally adjusted.	UDI: CPI inflation of the preceding month, not seasonally adjusted. TIIE: 28 and 91 day average of Mexican interbank rates.	Euribor: typically 1 year interbank rate quoted by major banks in the Eurozone.
Rate, prepayment and amortization regime	Fixed rate (UF) Yield maintenance prepayment fees with statutory caps. Serial amortization.	Fixed rate (UVR, FRM) Interest rate cap for social housing loans. No prepayment fees allowed Serial amortization for indexed (UVR) French amortization for nominal Peso.	Fixed rate (UDI, MW, FRM) Fixed margin (TIIE) No prepayment fees practiced. Serial amortization for indexed (UDI, MW) French amortization for nominal Peso.	Fixed margin (Euribor ARM) Max 0.5 % prepayment fee on ARMs. Yield maintenance prepayment fees on FRM. French amortization

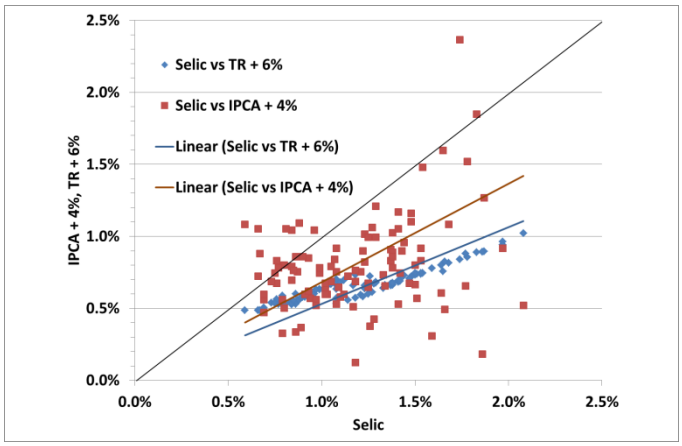
Source: Absalon (Mexico), Merrill Lynch, national regulator websites. Market shares are estimates. Notes: PLAM – price-level adjusted mortgage. FRM – fixed-rate mortgage (nominal local currency), ARM – adjustable-rate mortgage (nominal local currency).

Since then, demand for new lending has shifted almost entirely to Colombian Peso lending (see below). Among other things, the traumatic experiences with the UPAC crisis can be considered to have shifted consumer and lender sentiment against any form of indexation. Also, fixed-rate nominal lending rates have in the meantime declined to levels below current UVR rates (plus inflation), possibly reflecting higher perceived credit risk in UVR contracts.

Also, in the Mexican case, inflation indexing was adopted for mortgages using monetary correction in 1995 after the Tequila crisis, which had comparable features to the Colombian crisis. Volatile capital flows – huge inflows by foreign banks lending to Mexican banks followed by abrupt outflows during the crisis - had destroyed the usefulness of the historic indexation mechanisms based on government bond rates (CETES). Mexico as Brazil continues to use bank cost of fund indexing, however, it does so as a benchmark for adjustable-rate lending (i.e. where the interest payable is simply the sum of the cost of fund index and a spread and the outstanding loan amount is not corrected). In such types of products the payment-to-income and loan-to-value profile is heavily front-loaded. Hence the use of a potentially more volatile index is somewhat less problematic.

In that respect, in Spain mortgage loan rates based on 1-year-Euribor, the overwhelming interbank funding index used for ARM pricing, doubled from 3% in 2005 to 6% in 2008. While affordability for much of the Spanish portfolio was safeguarded via a swift decline in Euribor engineered by the European Central Bank via historically low policy rates, the shock itself lead to the bursting of the Spanish housing bubble and caused a general repricing of housing. Many Spanish mortgages are currently suffering from high loan-to-value ratios as a result.[36]

Figure 9: Closer co-movement, higher volatility of Selic vs. IPCA over Selic vs. TR, January 2002 – October 2010



Source: BACEN, Finpolconsult computations.Note: one IPCA observation (3.5%) omitted.

Compared to these cases, Brazil has been more successful in reducing the risk of cost of fund pass-through to borrowers. This is at least partly due to the construction of the TR'redutor', which apart from compensating for the differential in income taxation in SBPE vs. free market instruments aims at decelerating the impact of a sudden increase in bank cost of funds on SBPE borrowers.

- For example, when Selic reached 26.3% in January 2003 and the free bank deposit certificate (CDB) rates stood between 16 and 19%, TR remained at just 6.1%.

[36] According to February 2011 bank estimates published by the newspaper El Pais, some 20% of mortgages have LTV over 80%

- However, we also find that any 1% absolute increase in the SBPE - SELIC gap cuts back 2% of the real growth rate of savings. In 2003, with an average 13% gap real savings contracted by 7%. When the gap closed to a few percentage points as in the last three years, basically reflecting the tax effect, real growth was 10-20%.

Clearly, thus, capping the TR at low levels via the reductor protects existing borrowers against payment shock while punishing new lending and new borrowers caused by a reduced inflow of new SBPE deposits. This finding could speak in favor of altering the TR formula in a way that reduces the gap to bank cost of funds.

However, it is questionable whether a mere change in the 'redutor' will be more attractive to investors outside the Poupanca system. The capital market already uses inflation indexation in various forms. An unintermediated bank cost-of-funds index, in contrast, would clearly minimize the volatility of SBPE deposit inflows while transmitting potential bank financial stress situations, or the impact of excessive capital inflows, directly to borrowers.

The central question regarding index selection for Brazil going forward, which source of index risk will be higher and more costly for the government to deal with: sudden changes in bank cost of funds, in particular when associated with fast capital flows in and out of the system, or a sudden spikes in CPI inflation.

Table 2 suggests that comparator countries have given the answer by voting with their feet against bank cost of funds and in favor of inflation indexing or exit to nominal local currency lending. It should be noted that in the Chilean case, the inflation index Unidad de Fomento is now in use since 1967 and is considered an economy-wide accepted index. Obviously, the Chilean approach requires a sufficiently conservative monetary policy, which in turn may improve the conditions for exit to nominal local currency. Yet, at moderate inflation levels of 5-10% with limited volatility, inflation indexation may retain value.

Clearly, a move towards CPI indexation could help to reduce the SBPE - SELIC gap, as could a change in the TR formula. Figure 9 demonstrates the results for monthly data assuming a 4% deposit rate over IPCA. The price to to switch to a different index is higher volatility. How damaging is such volatility to credit risk, and should measures be taken to reduce it? We explore additional underwriting and contract design conditions for that case in the following.

The selection of a consumer price index (CPI) is considered a feasible option if a reformed TR composition proved impossible to implement. A frequently proposed CPI for mortgage market purposes in Brazil is the retail price index IPCA, which has the advantage of lower volatility compared with the wholesale price index IGPM. According to the feedback of market participants during the mission, preference was for IPCA as the index of choice.

To avoid any confusion among investors about the composition of the index, an index which is already applied in the market would be preferred. IPCA would meet this condition.

10.Index selection and contract design

In Brazilian housing finance, loan outstandings are adjusted monthly by the monetary correction, usually TR, upwards and by the chosen amortization schedule downwards. The housing finance profession calls this structure price-level adjusted mortgage (PLAM). Amortization is recalculated upon every reset of the loan outstanding by the monetary correction index. [37]

Negative historic experiences with the French amortization method ('Tabela Price') during the high and hyperinflation phases of the 1980s and 1990s have led to the universal use of serial amortization ('SAC') in the SBPE system. This helps to ensure a sufficiently fast downward correction of the outstanding and hence reduces future payment shock risk due to ballooning amortization payments.[38]

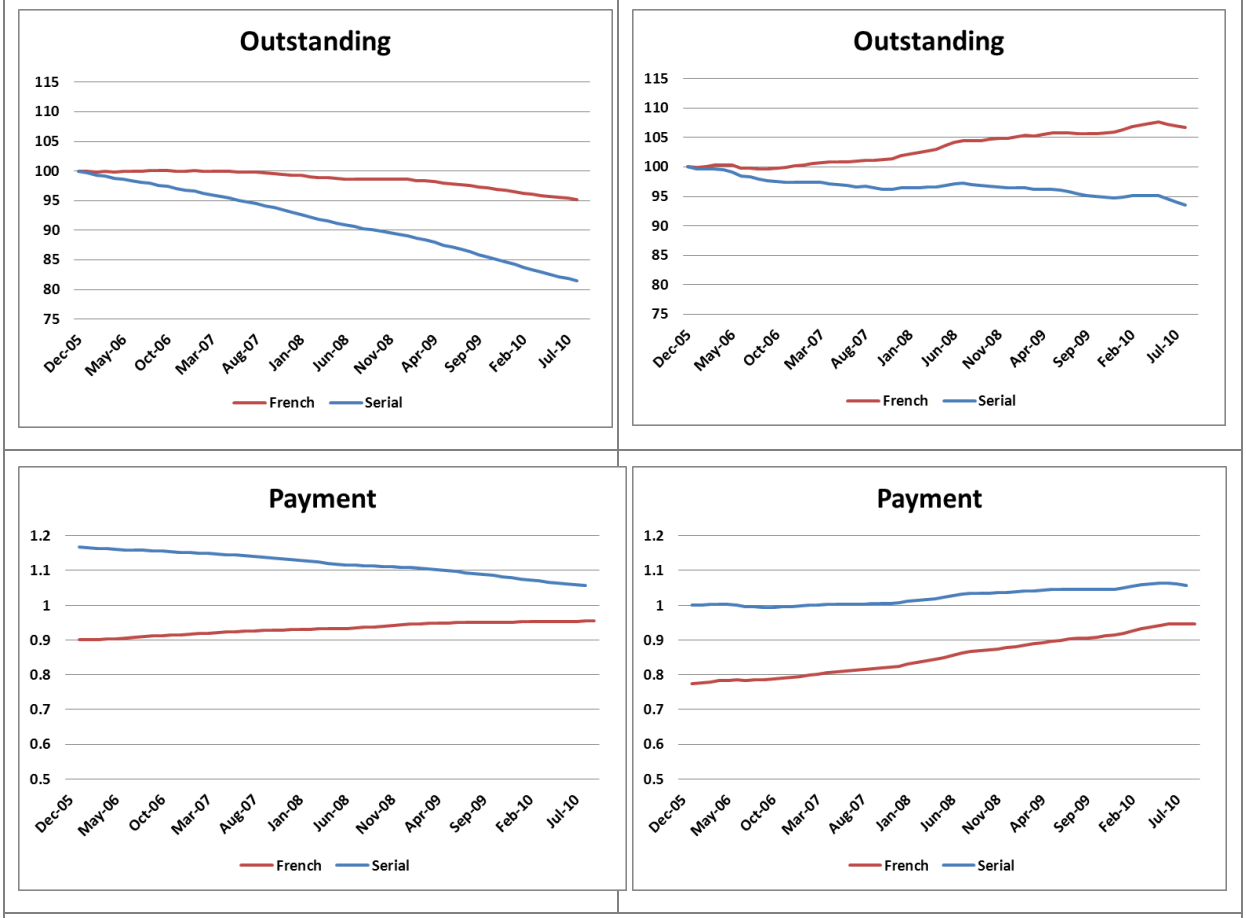
However, serial amortization is likely to reduce affordability by front-loading payments, which is contributing to the small scale of the housing finance market. This will become an even more serious problem for Brazil when inflation declines further (and hence loans are being amortized in nominal terms fast). For a calibration with historical data of a loan originated in December 2005, consult Figure 10.

[37] The PLAM is a fixed rate mortgage in real terms. The rate is set at the beginning of the contract and fixed for the entire life of the loan, and principal balance and payment are adjusted periodically for changes in a price index. Typically, the balance is adjusted frequently (monthly) and the payment less frequently (annually) leading to negative amortization on the loans.

[38] The French amortization method generates fixed installments for the borrower. While the payment remains constant, the ratio of amortization to the interest paid increases over time. The effect is a back-loading of the amortization of the loan, which increases future payment shock risk. In contrast, credit risk early in the loan life is low. Under the serial amortization method, amortization remains constant over the entire period, i.e. the loan is linearly paid down. This implies initially large and then declining installments, which raises credit risk early in the loan life. However, the fast amortization also mitigates future payment shock risk. Under inflation-indexed contracts, both amortization methods can be used. As the outstanding is recalculated periodically, the payments are recalculated in every period and become variable in both cases.

Figure 10: TR vs CPI lending and Serial (SAC) vs. French (Tabela Price) amortization - first 5 years of a loan originated in December 2005

TR lending (TR + 9%) | **CPI lending (IPCA + 7%)**

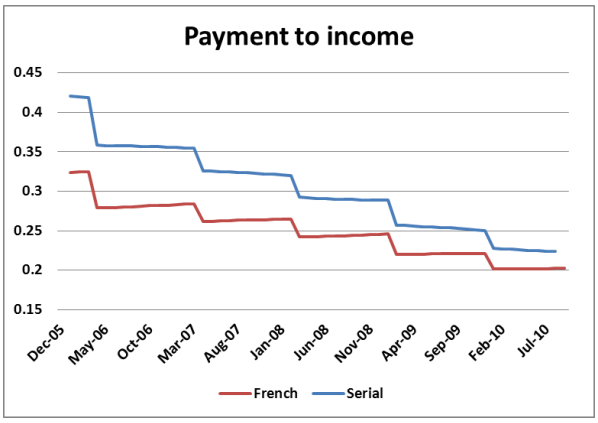
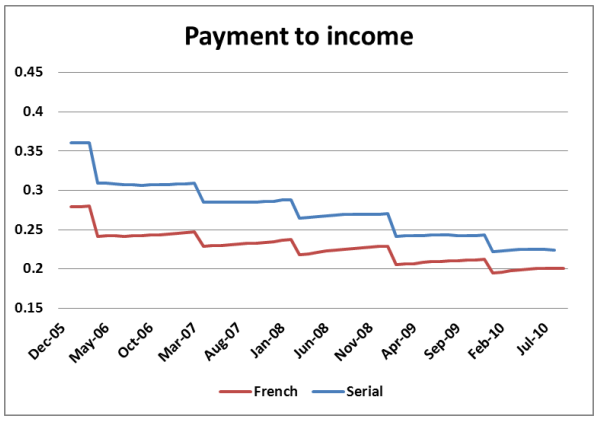
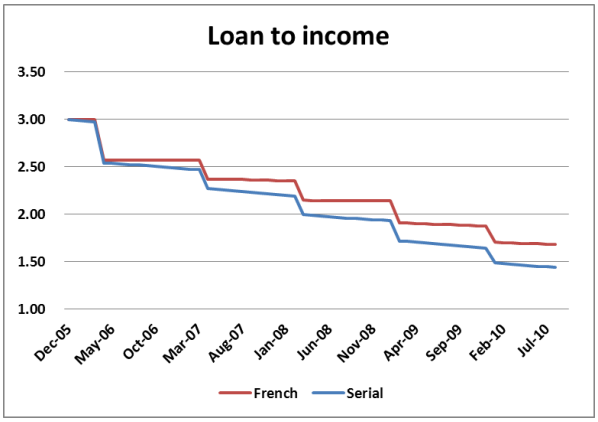
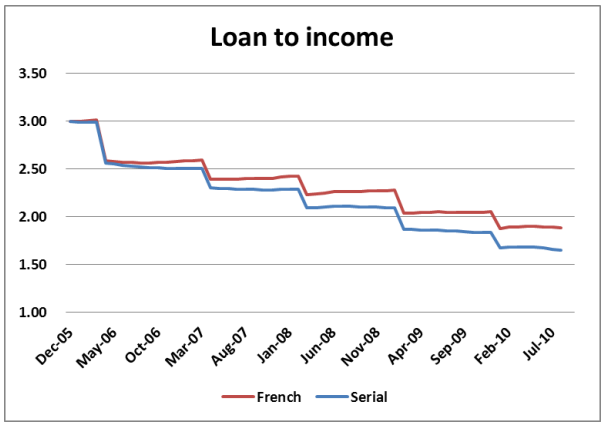


Source: Finpolconsult, BACEN data. Notes: 20-year loan originated in December 2005. Data right-censored per September 2010. Payment per month on a BRL100 loan. Current practice = TR and serial amortization.

The recent phase characterized by moderate to low inflation levels suggests two preferred approaches in conjunction with the selection of indices:

- Under CPI lending, serial amortization should be preferred in order to control the greater payment shock risk of a faster accelerating index.
- Under fixed-rate lending, or currently approximative zero monetary correction via TR, French amortization should be preferred in order to reduce the greater initial default risk.

Figure 11: Mismatch risk between inflation and minimum wage pattern – TR vs. CPI lending - first 5 years of a loan originated in December 2005

TR lending (TR + 9%)	CPI lending (IPCA + 7%)
	
	

Source: Finpolconsult, BACEN data. Notes: assumes income proportional to minimum wage, initial loan-to-income ratio of 3, and 20 year maturity.

Table 2 shows that this is the same amortization-product structure that Mexico has adopted with its dual product market (indexed, nominal). Figure 10 confirms the validity for Brazil for recent years – both approaches lead broadly to the same payment and outstanding time profile. Important caveats have to be applied to this argumentation, however:

- The dangers of assuming TR lending as close to fixed-rate lending are highlighted by the historical shock experiences discussed above. Serial amortization can be seen as a precautionary measure against such shock risk, albeit a very restrictive one.
- If the example is extended to the period of 2002 to 2010, i.e. when including the inflation spike of the summer of 2002/3, as discussed before a greater differential between IPCA and TR is found, with the potential to generate a higher shock in both outstanding and payments under CPI lending than TR lending.

This favors the keep of the serial amortization in the ICPA lending case. If inflation drops permanently, the payment profile under serial amortization becomes very steep. This could be the time for exit to fixed-rate lending under the French amortization method.

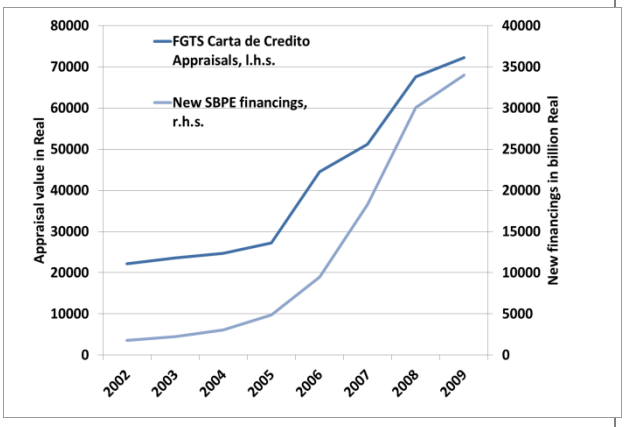
Only limited data was available regarding the actual credit risk of different indices during the low-inflation phase since the mid-1990s. Only pension funds offer mortgage loans the interest rates of which are indexed to IPCA. A pension fund interview suggested that lifetime caps of debt service to income values are being used to contain the risks of IPCA lending (in the case interviewed 30%).

The analysis simulates credit risk by using available wage and house price inflation data. A detailed analysis using the multitude of available wage information in Brazil is beyond the scope of this report. Figure 11 picks up the simulated loan of Figure 10 and determines a payment to income and loan to income ratio based on the pattern of appreciation of the minimum wage. The analysis assumes a borrower earning a certain multiple of the minimum wage and who has taken out a loan not exceeding three times his income in December 2005.

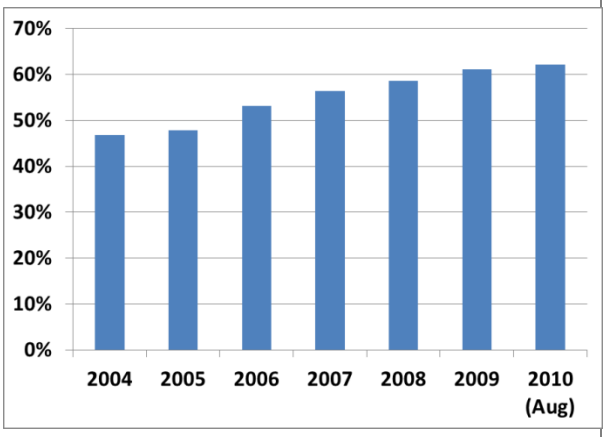
Clearly, the real increases in minimum wages in Brazil in recent years have sufficiently bolstered affordability for such a model household to ensure falling payment and loan to income profiles. Should real wage growth continue for the near future, IPCA would be preferable to TR due to its lower initial payment ratio; alternatively TR could be operated under French amortization.

Figure 12: Indicators of the Brazilian house price and loan-to-value ratio environment

FGTS Carta de Credito appraisal values (house price proxy) and SBPE savings, real values



SBPE loan-to-value ratios by vintage 2004-2010



Source: Caixa Economica Federal, Abecip, computations by Contacto Consultores and Finpolconsult.

More problematic than income in a booming economy is the recent apparent house price inflation. When borrowers underwrite at the peak of house price cycles, they may quickly accumulate negative equity – a potential default driver. Brazil lacks a national or even meaningful regional house price indices to address such risk. The analysis uses the FGTS

appraisal values of Caixa Economica Federal as a proxy for a house price index. Figure 12 on the left side shows that those values and the inflation of the housing finance system have moved closely together. Expressed in per capita GDP-figures, FGTS appraisal values have risen from 2.64 in 2002 to 4.40 in 2009. Expressed in minimum wages the multiple rose from 9.47 to 13.06. Anecdotal evidence, e.g. coming from real estate brokers, suggests that the risk of a house price decline after such strong appreciation spells as currently seen in Brazil has not been negligible in the past. Phases of house price decline in the 10-20% range have been recurring in the main centers.[39]

A structural problem, not limited to Brazil, moreover is that appraisers prefer the open market method which compares current housing transaction prices. The alternative would be the more conservative rental yield method, which values housing as the discounted cash flow of future saved rent payments of an owner, with the input of available rent data for similar properties. A focus on current transactions could lead to an overshooting of appraisals over long-term sustainable values. ABECIP data are showing a steady increase in loan-to-value ratios in recent years. The concern is not the level, but the dynamics, as the house price increases could be further fuelled. Even keeping new loan volumes simply growing proportionally with prices could increase credit risk.

In that regard, the Colombian mortgage crisis in 1999 was closely related to a strong earlier increase in loan-to-value ratios, which increased the fragility of household balance sheets. In a spatially narrow housing finance market with significant land supply problems, as Brazil's, it will only take limited additional loan supply to further boost prices and unleash a similar development.

Actual portfolio default ratios reported by ABECIP and BACEN show a strong decline for the current TR loan book. However, such ratios are typically misleading. They are not even an appropriate indicator of credit risk in an ex-ante sense. First, they measure defaults of a loan portfolio largely originated at lower historic house price levels and thus do not address defaults arising in the future from loans currently originated at higher house price levels. Second, they relate this underassessed nominator of defaults to a fast growing outstanding as a swiftly increasing denominator. In fact, low measured portfolio default rates in such a context should rather be interpreted as a warning sign, i.e. of the risk mitigating effects of strong and potentially unsustainable house price appreciation.

In conclusion, house price inflation, appraisal practices and loan-to-value ratios in the SBPE system deserve close attention by policy makers. Underwriting standards should be tightened with house price inflation. A move away from TR- to CPI-based lending gives further motivation for greater regulatory conservativeness: it should be accompanied by a moderate reduction of permissible LTV compared to TR-lending. The exact change in limits can be derived by means of simulations.

[39] As published at "O Estado de São Paulo", in 11/21/2010.

The transition from TR to IPCA is likely to require amendments of existing loan contracts. The legal feasibility and cost should be also taken into consideration if a change of the underlying index were considered. In a transition period, there could be a co-existence between an "Old-SBPE" system with the TR as underlying index and a "New-SBPE" with the IPCA as underlying index. Under current macroeconomic conditions, a transition from TR to IPCA could increase credit risk because of higher short-term volatility of the adjustment of outstanding SBPE loans. Although the initial payment burden would be lower for SBPE borrowers, they would be exposed to higher payment shocks in case the interest rate on the loan rises due to an increase in the index.

The risk of a payment could be mitigated by maintaining the serial amortization regime (SAC) and the maintenance of conservative underwriting standards and bank regulations (e.g. adequate LTV ratios, or declining LTV ratios in case of rising house prices).

11. Is inflation index modification necessary?

Adjustments to a consumer price inflation index are usually made to a) reduce volatility, and b) improve forecasting abilities for future inflation. Volatility might increase credit risk for borrowers while low forecasting quality might reduce investor interest in the index.

In contrast to TR, Brazilian consumer price inflation shows elevated volatility via strong seasonal effects generated mainly by food and administrative prices. Food prices rise faster in the summer than in winter, and administrative prices are often adjusted in January. Brazil is not generally indexing wages to consumer prices[40] as Colombia and Chile for instance are. Both for salaried employees and those with incomes tied to the minimum wage the actual adjustment dates vary; in the former case the extent of the adjustment is a result of collective bargaining. So higher default risk might arise due to mismatch in both timing and scale.

Two approaches are conceivable to address the timing issue:

- Seasonality adjustment: in contrast e.g. to Mexican INPC or the Chilean IPC which display very homogenous seasonal patterns, the Brazilian IPCA in the past 5 years has shown various inflation spikes in the winter months. This renders a technical seasonality adjustment more difficult.
- Use of a core inflation concept: BACEN has been experimenting with core inflation indices excluding food, energy and administrative prices, as well as alternative smoothing algorithms eliminating price spikes from index construction. According to a BACEN paper these

[40] The pattern is a negotiation between labor and employers' unions, coming out yearly in different dates, with a "dissidio".

measures, while reducing volatility have not led to an improvement of the forecasting function of the adjusted index.[41]

It is worth pointing out that the most important Latin American comparator countries as shown in Table 2 use simple lagged monthly inflation measures that are not further modified. In Chile the procedure is operational with only minor modifications since 1967.

The revealed preference in comparator markets against modification of inflation indices seems driven by investors who in Latin America are wary of potential manipulations of indices when adjustments are made by governments. This is different, e.g. in the United States where core inflation is an accepted modification. Clearly, however, there is a price to pay for a purer approach, in particular by lenders and borrowers in terms of seasonal volatility of the index and as a consequence a need for more conservative underwriting.

Given the reluctance of investors to accept inflation index smoothening or elimination of basket components and given the moderate credit risk impact of the modest short-term CPI spikes recently seen for a long-term credit, we would like to suggest the use of an unmodified inflation index.

12. Transition to nominal lending – mid-term or short-term perspective?

Most interviewed lenders support a partial transition to nominal lending sooner than later. As per a BACEN ruling of 2007, already SBPE lenders are allowed to provide fixed-rate mortgage loans in parallel to TR-based mortgage loans. However, there appears to be no significant portfolio currently, even though, or perhaps because, TR is de-facto zero.

It is positive that lenders interviewed uniformly favor FRM as an exit strategy and few voices in Brazil are heard favoring nominal ARMs. This is encouraging against the background of negative experiences in Spain and Mexico:

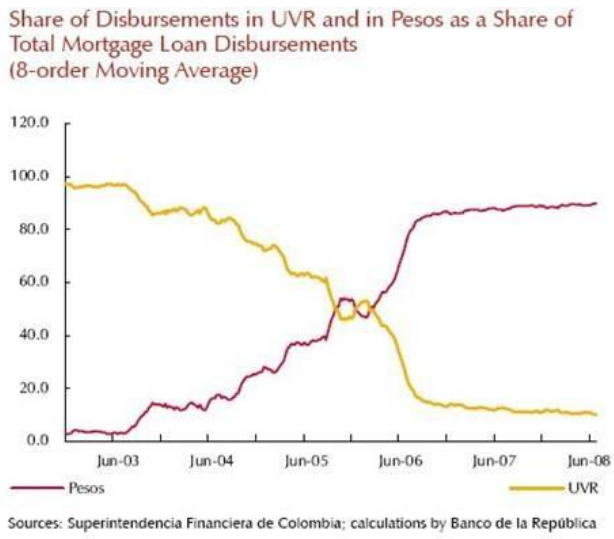
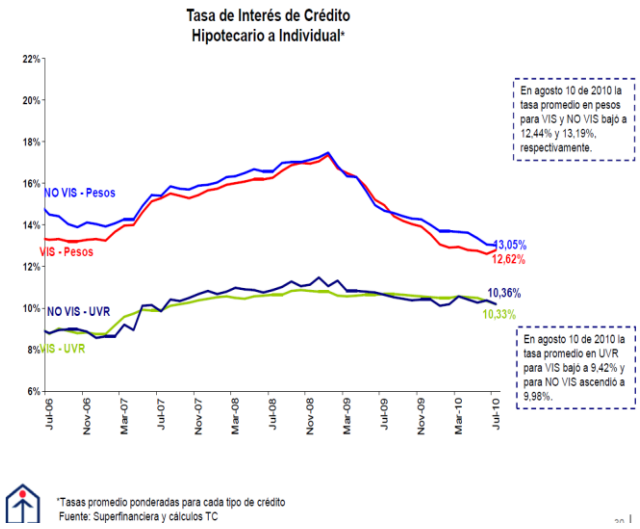
- In Mexico, the exit of lenders from dual index mortgages (DIMs)[42] in 1993 to ARMs indexed over government bond rates ended in the disaster of the Tequila crisis of 1995, when ARM rates reached 100%. The entire ARM portfolio defaulted. While the risk of a shock of this scale appears currently as rather remote for Brazil, the case highlights the validity of the current preference for fixed rates, or at least a PLAM with fixed rates with more moderate risk.
- In Spain, the move from fixed-rate lending to Euribor-based ARMs has led to the opposite problem of extreme rate contraction with adverse consequences for house price inflation and

[41] Da Silva Filho, Tito Nicias Teixeira and Figueiredo, Francisco Marcos Rodrigues. 2009. "Has Core Inflation Been Doing a Good Job in Brazil?".Central Bank of Brazil. December. Download from: http://mpra.ub.uni-muenchen.de/23340/

[42] The DIM attempts to address the affordability problem by indexing the payments to wages but allowing the accrual rate on the loan to vary with inflation or a nominal interest rate. If the wage and rate indices diverge for a period of time, the loan my not amortize.

underwriting of de-facto subprime borrowers at very low rates (esp. during 2003-2005). Spain in the past years has taken various measures, including the expansion of the legal room for prepayment penalties and regulatory incentives, to enhance the fixed-rate lending share again – so far with no result. For Brazil this means that staying within a fixed-rate regime, rather than trying to get into it back after it has been abolished, should be the preferable strategy.

Figure 13: Exit from indexed lending in Colombia

Market shares of CPI lending (Unidad de Valor Real) and nominal Peso lending in Colombia, 2003 - 2008	Interest rates of CPI lending (Unidad de Valor Real) and nominal Peso lending in Colombia, 2006 - 1010
	

Colombia, in contrast, has managed to almost entirely exit from indexed lending and at the same time retain the fixed-rate lending standard. Despite the initially considerably higher interest rate level of FRM, house prices in the meantime recovered, new lending accelerated and a construction boom was seen in the late 2000s. FRM affordability has been substantially supported by a change in the amortization method to the French amortization method. In the meantime, as Figure 13 shows, also FRM rates have declined substantially.

Still there is limited visibility as how the exit from the PLAM system in the Brazilian case could work. Generally, nominal Selic rates of 8% and below are seen as a precondition for exiting in mortgages to rates somewhere at the same level. The system seems to be waiting for the event to happen soon, although the strong current economic growth speaks rather against this scenario. However, even in that scenario a market risk remains. This strengthens the case for either using long-term bonds or supporting long-term savings, e.g. by changing the taxation approach (see below).

Also, a close review of the type of FRM used and especially the prepayment regime is of importance. Clearly, a mortgage with a lifetime fixed interest rate over 20 or 30 years is a

desirable product from a consumer protection standpoint. But such a product will suffer from high prepayments as interest rates compress, which will render it both difficult to price and costly, because investors charge a yield markup for the reinvestment risk. Prepayment penalties are infeasible on such very long-term fixed rates; howver, they could be an option for shorter fixing periods.This alternative, a ’reset’ FRM, i.e. interest fixings for intermediate periods but not for loan lifetime, is practiced in Canada (5 years) or Germany (typically 10 years). The term ’reset’ refers to the requirement to adjust the rate after the fixing period has expired. Such types of loan products can be easily funded by debentures or mortgage bonds.

Should lending rates in Brazil drop below 8 to 10 % over a longer period, the abolition of the indexation system could be considered. International experience has shown that interest rate equal or below this level is a threshold for the kick-off of a viable mortgage market. Given the re-emergence of inflationary pressures, a transition to nominal lending is unlikely to be considered in the near future.

A nominal interest rate system has considerable advantages over an indexation regime in view of credit risk, bank funding strategies as well as being acceptable to domestic and foreign investors. The abolition of the indexation system should only be pursued if the decrease in interest rates was sustainable in the long term. Colombia has successfully exited from indexation to nominal Peso lending, and Mexico is increasing its nominal Peso market share.

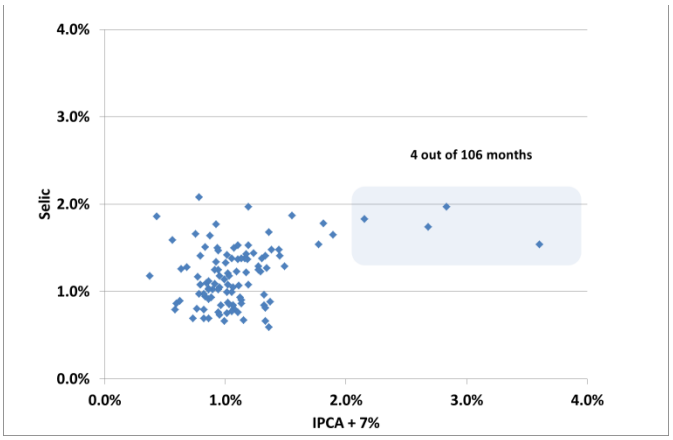
Fiscal support

13. A new guarantee scheme to protect against index risk?

There are three approaches to protect borrowers against excessive index mismatch under CPI lending: regulation and insurance, or both in combination.

Lenders might try to undermine a pure regulatory approach beyond what already exists (e.g. the prohibition to capitalize interest). The outcome would likely be similar to Spain, where Euribor interest rates are capped contractually due to legal requirements; however, they are in practice capped at extremely high interest rate levels not causing cost to the lenders and exposing borrowers to severe payment shock risk. The historic US legal requirement, terminated in the late 1990s only, to limit negative amortization to 120% of the initial loan amount, in contrast, might put Brazil into a narrow corset, given higher historic inflation rates and the growthprojections. A Brazilian version of regulation should possibly rather consider limiting the current loan-to-value ratio directly, i.e. the potential amount of negative equity, to avoid overindebtedness of the household. Such a step could also increase incentives for lenders to reduce underwriting loan-to-value ratios as house prices inflate.

Figure 14: Monthly rates IPCA+7% vs. Selic, Jan 2002 – October 2010



Source: BACEN, Finpolconsult computations.

An insurance solution could cancel excess debt created by inflation indexing. See 3 for a comparison to Selic and the identification of critical recent IPCA spikes. Any new scheme would be foreshadowed by the history of the FCVS wage-inflation mismatch insurance fund with still BRL 38 billion in legacy debt inside the SBPE. FCVS failed because of political intervention into inflation indices used for mortgage finance during the 1980s. As loans did not amortize, as a result of the interventions, the government was left with large amounts of residual debt.

It is still worthwhile for Brazil to exploring the more encouraging recent example of Mexico. The agency SHF there has had reasonably positive experiences with offering a minimum wage-inflation (UDI) swap to lenders since 1999. Loan maturities for up to 25 years are protected by the agency. For a 20 year loan the current premium is 4.35% of the interest rate. Translated to an IPCA +7% loan this would mean additional cost of 0.48% (over currently 12.22%). As we have seen above, however, an inflation index is better able to absorb such additional insurance cost than the TR due to the flatter resulting payment-to-income profile shown above. Clearly, pricing

is a key issue. Recently in the Mexican market lender fatigue with using the swap has risen as both indices moved almost in parallel.

Protection of lenders against mismatch (basis) risk is a more acute issue, as long as TR remains in place. Currently several lenders do already swap funds raised in consumer price indices into TR (Santander, Itau, Caixa). Alternatively going forward there will be need to swap fixed or float nominal funding into TR. Should deposits remain tied to TR and be insufficient to fund housing loan demand, it is very unlikely that lenders will offer their clients different indices at the same time. Such practices may also quickly become prohibited by court intervention.

Experiences with the Colombian FRECH scheme protecting mortgage lenders against basis risk on a voluntary basis are less encouraging than in the Mexican case. FRECH was capitalized by the government and the banking industry, primarily to help capping bank cost of funds when offereing UVR lending (as the system had moved out of bank cost of fund indexation, see Table 2). The financial terms of participation, however, proved too costly to banks[43], and recently the Colombian market has de-facto moved out of UVR into Peso lending.

Against this backdrop, a move to CPI lending and providing at least lower-income borrowers with a public index swap program along the Mexican lines should be an option for Brazil. Where FRECH might find an analogy in the Brazilian case is in the form of assistance to banks to issue long-term debentures or bonds indexed to consumer prices, or nominal fixed, as per the currently planned corporate bond fund.

14.Investor tax treatment

The current tax support strategy applied in Brazil may not support mortgage lending in ideal way, as the quick comparison in Table 3 shows. The fiscal costs of exempting the entire deposit base must be considered large. While most of the funding instruments for mortgages are tax exempt, some are not.

Most important for mortgage funding is the distortion of the funding instrument yield curve. Issuers of capital market instruments have to unfairly compete with banks pursuing a mismatch strategy: these banks are able to price loans over apparently (on a non-risk adjusted basis) cheaper funding sources. This creates a cost-of-funds cliff-edge effect as the housing finance system moves out of deposits into capital market instruments. If the system does not outgrow deposits, it confines the use of capital market instruments to higher risk lending operations.

Deposits that re-price and are callable only after 3 months, 6 months, or preferable 1 year would be close to sufficient to match-fund mortgages in the declining interest rate scenario associated

[43] The FRECH fund tied up about COP 350 billion in capital, a substantial portion of scarce industry capital. The banks remain exposed to a mismatch between their peso liabilities and inflation-indexed assets. It is thought though that insufficient capital requirements for interest rate risk contributed to the outcome. Recently, FRECH has been recast as an interest rate option program, where banks are permitted to buy varying amounts of protection for varying periods of time against increases in funding cost.

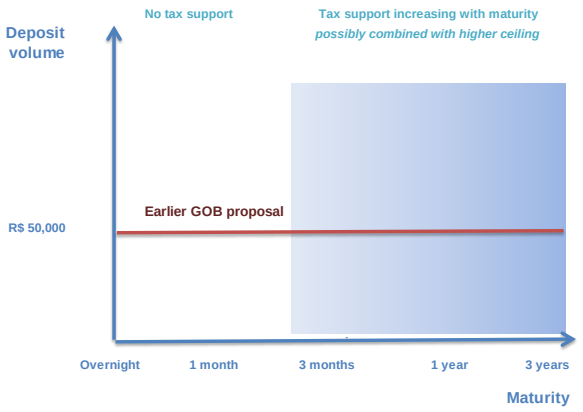
with high prepayments (see Figure 7 on the left-hand side). The Spanish mortgage market, for example, almost entirely relies on a 1 year repricing benchmark which emerged early in its 15 year rate decompression period (enabled by Banco de Espana in 1994). If interest rates do rise, the longer maturity of deposits provides at least for some protection against extension risk (see Figure 7 on the left-hand side). Again, it is noted that the SBPE has been initially constructed as a system relying on deposits with maturity of 3 months and longer.

Table 3: Taxation and other characteristics of alternative funding instruments for housing loans in Brazil

Fiscal costs and characteristics of mortgage funding instruments compared (sorted by maturity)

	Poupanca deposits	Certificates of deposits (tied to Selic)	Mortgage bonds (letras/cedulas)	Certificates of real estate receivables (CRI)
Government guarantee?	YES	NO	YES	NO
Income tax treatment?	EXEMPT	TAXED	EXEMPT	EXEMPT
Maturity	DAILY	MONTHLY	ASSET	ASSET
Cash flow	STRAIGHT	STRAIGHT	PASS-THROUGHS	PASS-THROUGHS
Monetary correction	TR	SELIC	IGP-M	IGP-M
Spread ca.	6% (fixed)	NONE	n.a.	6-15%
Nominal return per Nov 10	6.5-7%	9.5-10%	n.a.	>>10%

Taxation model re-establishing the pre-inflation phase SBPE 3 month minimum holding period



Source: Finpolconsult, Contacto Consultores.

Term deposits would mimick the funding effects of the issuance of bank bonds until bank bond issuance picks up or covered bond legislation (reducing the cost of bank bond issuance) is passed. The terms of deposits can be extended through contract savings for housing systems that commit potential future housing loan borrowers to a longer savings phase of 2-5 years before applying for a loan.

It is noted that the proposed Basel III regulations intends to lend strong supports to term deposits with 1 year or longer maturity via the 'Net Stable Funding Ratio' requiring the matching of loans over 1 year maturity by funding instruments over 1 year maturity. While short-term deposits will receive a high level of recognition of being able to roll into long-term, it will not be complete and prudent bank regulation should recognize the significant repricing risk even as deposits may remain liquid.

Regarding the implementation strategy, short-term deposits should be first gradually delinked from tax support and subsequently from credit direction towards housing, where they serve to create large liquidity and interest rate risk.

A focus of tax reform on maturity avoids the political risk of imposing a ceiling on per-saver tax support, which has failed recently. In addition, reserve requirements could be differentiated by deposit maturity.

To improve liquidity management within the SPBE system, interest income on SPBE deposits should be wholly or partly exempt from personal income tax, depending on their maturity. For example, minimum eligible deposit maturities for personal income tax exemption should be from 3 months upwards. A term of 3 months is considered a minimum maturity acceptable for housing finance purposes.

Deposits with maturity greater than 3 months could bear additional incentives, e.g. a higher exemption rate. Over time any tax concessions on short term deposits should be phased out and eventually the practice of directing long-term credit to housing financed by short-term deposits should be abandoned.

Another option is the differentiation of reserve requirements according to deposit maturities. In this case, longer maturities would be subject to lower reserve requirements.