Brazil and the 2008 panic

Mário Mesquita[1] and Mário Torós[2]

Brazil before the crisis: the asset price boom and economic upswing

Although the subprime crisis started in the summer of 2007 (in the northern hemisphere), it only reached Brazil, and emerging markets in general, after the collapse of Lehman Brothers. Major central banks at the core of the crisis responded by aggressively easing policy from mid-2007, while also introducing measures to help revive interbank funding markets. Thus, capital flows to emerging markets, most of which had deleveraged and strengthened fiscal and monetary policy frameworks in previous years, were initially spared.

Emerging economies with rigid exchange rate regimes imported the monetary policy stance prevailing in mature economies, which was ill-suited to their own cyclical positions and, as a result, started to experience faster growth, asset price appreciation and, in several cases, rising inflationary pressures. Even emerging economies, such as Brazil, with flexible foreign exchange regimes, started to see faster asset price appreciation (partly derived from the improvement in the sovereign rating), stronger economic growth, as well as accelerating inflation.

Thus, equity prices (the Brazilian stock index – IBOVESPA) rose by 20% (in local currency) between June 2007 and June 2008 (44% in USD terms). The local capital market saw R$ 165 billion of issuance, equivalent to around 5.6% of GDP (a new activity record), thereby helping to fund Brazilian corporates. At the same time, bank credit rose from 32% to 36% of GDP. Not surprisingly, the economy accelerated, with year-on-year GDP growth rising from 5.4% to 6.8% between Q3 2007 and Q3 2008, while domestic demand growth rose from 7.7% to 9.5%. Between June 2007 and June 2008, as economic activity strengthened, led by domestic demand, the current account balance went from a surplus equivalent to 1.1% of GDP to a deficit of 1.4% of GDP, while accumulated inflation rose from 3.7% to 6.1% and 12-month ahead inflation expectations increased from 3.5% to 5.3% – above the 4.5% central target.

The Banco Central do Brazil (BCB) thus undertook a monetary tightening, aimed at aligning the speeds of aggregate demand and supply growth, as well as reining in inflation expectations, with the ultimate goal of bringing inflation back to its target. On the regulatory front, the BCB had taken measures in 2007 to limit financial institutions' exposure to exchange rate volatility.[3] Those measures proved their worth in the 2008 panic, by limiting the direct exposure of Brazilian banks to the strong currency depreciation seen between August and December 2008.

The macroeconomic scenario changed suddenly and sharply in Q4 2008 in the aftermath of the failure of Lehman Brothers and the heightened stress in global financial markets. There is no doubt that Brazil was better prepared to face the crisis than in previous periods. Nevertheless, the crisis led to a substantial tightening of financial conditions in foreign and

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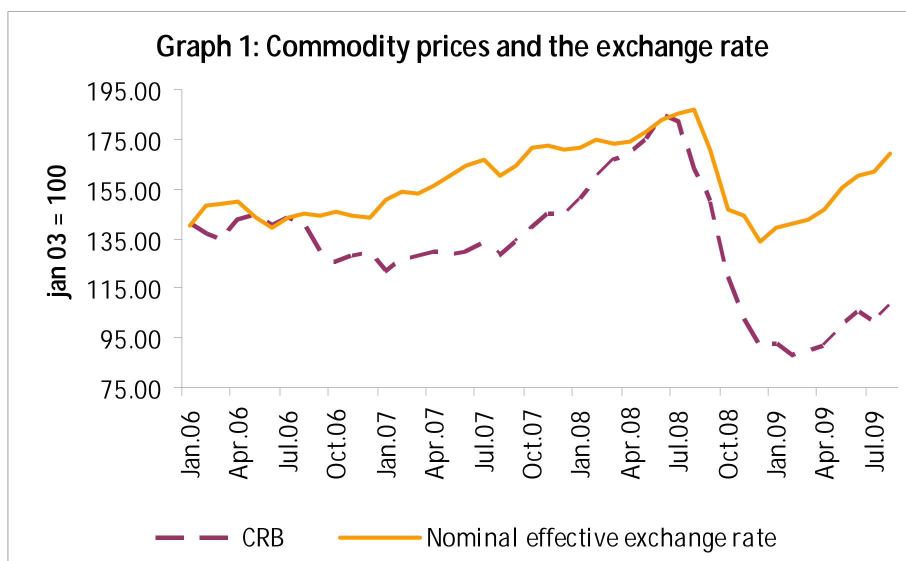
[1] Central Bank of Brasil, Deputy Governor for Economic Policy up to March 2010.

[2] Central Bank of Brasil, Deputy Governor for Monetary Policy up to December 2009.

[3] *Circulares* nos 3351, 3352 and 3353 of 8 June 2007.

local currency and had a negative impact on consumer and business confidence and, of course, on economic activity.

This was a global crisis, and its strongest initial effect was BRL depreciation, which resulted from the global USD liquidity squeeze as well as from the terms of trade deterioration brought about by falling commodity prices (Graph 1).



Source: Bloomberg, Banco Central do Brasil.

The exchange rate depreciation was magnified by the effects of non-financial corporate exposure to foreign exchange derivatives.[4] BCB research, based on supervision data and information on bank client positions in the clearing house CETIP SA (Balcão Organizado de Ativos e Derivativos), shows that such exposure was close to $ 37 billion (delta) by the end of September 2008. This estimate was taken into account in the BCB's crisis management strategy.

The USD liquidity squeeze had many aspects. The volume of export finance contracts, dubbed ACC, fell by 30% between September and October, while the rollover ratio of external debt fell from an average of 167% in January–October to only 22% in November. Short-term foreign funding of Brazilian banks contracted sharply from August – cumulative net remittances reached R$ 11.4 billion in the second half of 2008. Finally, externally funded domestic credit, adjusting for exchange rate changes, fell by 11% between August and October 2008.

Note also that, as in other sectors of the economy, Brazilian banks took advantage of the pre-Lehman Brothers period of high global liquidity and rising sovereign credit ratings to increase debt and equity issuance to domestic and foreign investors. Specifically, in 2007, 11 small- and medium-sized banks (with a net worth of less than R$ 7 billion), issued R$ 6.2 billion in equities (initial and secondary offers) with the significant participation of foreign investors. With a bolstered equity base, small- and medium-sized banks could accelerate

[4] Similar developments occurred in other emerging economies, such as Mexico, Poland and the Republic of Korea.

loan growth – this trend was also favoured by their presence in the fast-growth payroll-backed credit segment.

In Brazil, the funding of smaller institutions is normally based on time deposits by a limited number of institutional investors, whereas bigger banks rely on retail funding. Well-established Brazilian market practice, due to years of macroeconomic turbulence and high volatility, requires that banks effectively offer short-term liquidity to their deposits, regardless of the original nominal maturity. Therefore, the concentration of deposits seems to be far more relevant from the viewpoint of liquidity risk than (apparent) duration.

Thus, a combination of structural factors, such as a reliance on concentrated sources of funding, as well as cyclical factors, such as the USD liquidity squeeze in a context of fast credit expansion, made smaller Brazilian institutions vulnerable to a *domestic* liquidity squeeze. Added to this was a process of flight to quality, that is, towards assets with explicit or implicit federal government guarantees, and away from private debt, which affected not only the funding of smaller banks but also led to pressure on some investment funds. Finally, the increase in asset price volatility, especially equities and the exchange rate, led to a substantial rise of margin requirements at the São Paulo Mercantile and Futures Exchange (BMF) and the São Paulo Stock Exchange (BOVESPA) – from R$ 72 billion, on average, in August, to R$ 93.6 billion in December. These developments led to the BRL liquidity squeeze described in Table 1, in which available liquidity is defined as the sum of cash reserves, reserve requirements held at the BCB (in bonds and cash) and available government bonds.[5]

Table 1

Liquidity availability utilisation

Class	**8 Sep 2008 - 12 Sep 2008**		**6 Oct - 10 Oct 2008**		**17 Nov 2008 - 21 Nov 2008**	
	number of banks	Share of the payments (%)	number of banks	share of the payments (%)	number of banks	share of the payments (%)
0 - 30%	83	90.8	29	75.5	88	94.8
30-70%	20	8.8	36	19.1	15	4.2
70-100%	3	0.4	41	5.3	3	1.0

Source: Banco Central do Brasil.

The data shows that the number of financial conglomerates displaying high liquidity utilisation jumped from three to 41 in the aftermath of the collapse of Lehman Brothers. On the other hand, the volume of payments affected was relatively modest, as deposits flew from smaller to larger institutions but not outside the system. Moreover, by mid-November, the system had already overcome the more acute liquidity squeeze – although the implications of tight banking sector liquidity on credit growth were to be felt for much longer.

[5] In Table 1, the 3–70% class, for instance, refers to institutions that utilised between 30 and 70% of their intraday liquidity availability to meet commitments in the payments system.

Crisis management: liquidity provision in USD and BRL

The various BCB initiatives to tackle the liquidity issues, in BRL and USD, were adjusted to market conditions at every stage of the crisis but followed certain basic principles. The first was to prevent crisis management from jeopardising the monetary policy regime, namely inflation targeting and a floating exchange rate. The second was to minimise BCB financial exposure to private sector decisions. The third principle was to avoid rewarding excessive risk-taking by the private sector, which would have increased moral hazard within the system. The BCB also acknowledged that there was intense uncertainty regarding the duration of the crisis – this meant preparing for a scenario of protracted global financial turmoil.

With regard to USD liquidity provision, uncertainty about the duration of the crisis led the BCB to undertake not only sales of USD spots but also repo auctions, thereby signalling that it was prepared to supply liquidity for a long time, while also mitigating the risk of a fast depletion of foreign exchange reserves. Such risk was limited, too, by accepting that the exchange rate had to respond to the change in fundamentals, even if that implied some initial overshooting. Nevertheless, the BCB acted in a timely way to alleviate the liquidity squeeze in the USD market – repo USD auctions were announced on 18 September and the first one took place a day later, on 19 September. It should also be noted that, although the BCB provided liquidity while allowing the exchange rate to adjust, it never adopted any preset limit for its USD operations.

Overall, the BCB sold US$ 14.5 billion (7% of total reserves as of end-August 2008) on the spot market from 8 October through auctions to foreign exchange dealer banks, following the same structure as those employed in the building up of foreign exchange reserves, ie at the going market price. With the normalisation of liquidity, such auctions were discontinued from February 2009. At the same time, the BCB placed US$ 11.8 billion through repo auctions, also operating with foreign exchange dealer banks.

The BCB innovated through the introduction of a window for foreign exchange reserve lending aimed at supporting trade finance. Lending, rather than selling, reserves was seen as an approach that was both more prudent and efficient than simply selling reserves. Since the goal was to ensure a minimal supply of liquidity to trade finance, the loan auctions were open to all banks that operated in the Brazilian foreign exchange market rather than just the *dealer* banks. Setting up this window required not only substantial operational measures within the BCB but also changes in legislation.[6] The first loan auction took place on 20 October, and the whole programme reached US$ 12.6 billion, of which US$ 9 billion was targeted at the ACC market.

Another innovation was the agreement, announced on 29 October 2009, of a currency swap arrangement with the Federal Reserve.[7] The arrangement was essentially seen from the beginning as a signalling device, despite the absence of a pre-commitment to use the available funds, which could reach $ 30 billion. Its goals were, on the one hand, to level the playing field for Brazilian banks in their foreign issuance, as the Federal Reserve had already announced swap arrangements with other central banks and, on the other hand, to signal the importance of the Brazilian financial system to global market participants, in a context of heightened differentiation among emerging economies. The swap announcement seems to have been effective in boosting confidence and thereby in reining in expectations of further foreign exchange volatility, even though the BCB did not tap the facility.[8]

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[6] Medida Provisória 442 of 6 October 2008 (later Law no 11.882).

[7] The agreement was made legally possible in Brazil thanks to Medida Provisória 443 of 21 October 2008.

[8] Stone, Walker and Yasui (2009).

Besides providing liquidity to the spot market, the BCB also acted in the derivatives markets, specifically the foreign exchange swap market. In the pre-crisis boom period, the BCB had built up a long USD position in foreign exchange swaps, which reached $ 23 billion by June 2008. The exposure of non-financial corporates to foreign exchange derivatives led to major imbalances in the futures market, which inevitably added to pressure on the spot market. Under those circumstances, the BCB started to unwind its reverse swap position (BCB long USD) and, from the beginning of October, started to sell traditional swaps (BCB short USD), thus providing a hedging device to its counterparties.

Given the considerable uncertainty about the magnitude of exposures to foreign exchange derivatives among non-financial corporates, foreign exchange market volatility rose significantly. Thus, it was important to act promptly to re-establish normal conditions and price-setting in the futures market. In that regard, the BCB announced, on 23 October 2008, that it would sell up to $ 50 billion of foreign exchange swaps. This amount was set by taking account of both the estimated size of foreign exchange exposures, hence the size of the potential demand for hedge, and the magnitude of foreign exchange reserves. The latter aspect was important because announcing an exaggeratedly large supply of swaps (relative to total reserves) might have led to the perception that the BCB wanted to prevent the currency from adjusting, eliciting the kind of one-way bet that characterises speculative attacks. Therefore, the announced volume of up to $ 50 billion was equivalent to around 25% of pre-crisis reserves. With the positive effects of the package of measures and the gradual normalisation of international financial conditions, actual sales of swaps only reached $ 12 billion.

Besides providing USD liquidity, the BCB had to ensure adequate liquidity conditions in local currency. This meant not simply increasing the liquidity available to the system, but rather channelling it to where it was needed. It should be noted that there was no deposit drain at a systemic level, only an increase in concentration within large-sized institutions. In aggregate terms, bank deposits actually rose, partly as a result of migration from investment funds that were exposed to the equity market into time deposits.

After the failure of Lehman Brothers, increased risk aversion led to a concentration of deposits in large institutions. Thus, between August 2008 and January 2009, while total deposits grew by 13%, deposits in large banks rose by 20%, and those in medium- and small-sized institutions experienced declines of 11% and 23%, respectively.

Against this background, the BCB took measures to alleviate the liquidity squeeze while ensuring that monetary policy decisions were focused on its macroeconomic objective, namely to align inflation to its targets. This followed the separation principle, that is, the segmentation between monetary policy and liquidity management, a well-established operational concept in central banking.[9] It is important to recall that, in the acute period of the crisis, from September to October 2008, inflation expectations, and the BCB's own inflation forecasts, were clearly overshooting the targets. This resulted from the acceleration of inflation and intense utilisation of production factors seen before the crisis, as well as from the substantial currency depreciation that followed its onset. Under such circumstances, premature policy easing, which could not have contemporaneous effects on activity, would have had negative implications for inflation expectations, jeopardising the credibility of the BCB's commitment to price stability and therefore preventing the central bank from taking action that, with appropriate timing, had important anticyclical effects.

Thus, the BCB and the National Monetary Council (CMN) implemented a series of liquidity management measures, adapting the policy response to the changing conditions in the

[9] See, for instance, Gonzáles-Páramo (2008), Trichet (2008) and Tucker (2009).

market.[10] Over time, when market segmentation between small and larger institutions became stronger, measures became more targeted. Such measures involved three areas: reserve requirements; the Deposit Insurance Fund (FGC); and the discount window.

Reserve requirements reached R$ 250 billion in the immediate pre-crisis period. Simulations based on pre-crisis rules show that the amount of reserve requirements would have reached R$ 295 billion by end-August 2009, compared with the actual observed volume of R$ 179 billion. Thus, the reserve requirements released amounted to around R$ 116 billion, or 4% of GDP at 2009 prices. The bulk of the released funds referred to drawdowns of the so-called "additional requirements" (that had been introduced in the 2002 crisis) of R$ 42 billion, and of requirements on time deposits (R$ 62 billion).[11]

Moreover, reserve requirement rebates were used to spread liquidity throughout the system. This was achieved through incentives for the use of released funds in the acquisition of assets of small- and medium-sized banks. Specifically, the authorities introduced deductions of reserve requirements on deposits from leasing companies and on time deposits subject to restrictions: they were to be used to buy assets from other banks provided that (a) there were no asset purchases within the same financial conglomerate; (b) the selling bank had equity of less than R$ 7 billion; and (c) purchases from a single institution did not exceed 20% of the reserve requirements (held in cash) of the acquiring bank.

Reserve requirement rebates were also directed at USD purchases by the banks so as to offset the effects of USD sales by the BCB on local currency liquidity – *Circulares* no 3.412 of 13 October 2008 and no 3.427 of 19 December 2008.

In addition, there was a substantial overhaul of regulation regarding the discount window. Specifically, Law no 11.882 and CMN Resolution no 3.622 established that discount window operations could have tenor of up to 359 days, as well as criteria for the acceptance and pricing of banks' assets and enabled the BCB to impose corrective actions to institutions that relied on that window. The initiative also involved several operational measures within the BCB regarding data transfer, analysis and pricing of loan portfolios that were deemed necessary in order to set in place a timely and efficient discount window facility. However, beyond ordinary intraday loans, the discount window was not used during the crisis, as banks feared the stigma effect.

The crisis highlighted the flexibility and usefulness of the Deposit Guarantee Fund (FGC) within the system's safety net. In addition to enhancing its ability to buy assets from banks, the FGC introduced a programme of bank certificates of deposit purchases.[12] Finally, in March 2009, the authorities introduced Guaranteed Time Deposits (DPGE), backed by the FGC, with tenors from six to 60 months. Those deposits were limited to R$ 20 million per account per bank and required that the issuing banks increased their contributions to the FGC. The introduction of the DPGE succeeded in reviving issuance by smaller institutions – the amount of time deposits in small banks rose by around 24% between March and May 2009. The timing of the introduction of DPGE was important since, as shown by international experience during the crisis, the setting up of guarantee mechanisms in periods of high stress can be counterproductive because it can risk stigmatising entire classes of institutions, with negative effects on liquidity distribution.

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[10] The CMN is comprised of the Finance and Planning Ministers, in addition to the BCB Governor, and has jurisdiction over some regulatory matters, including reserve requirements for savings accounts.

[11] Measures on reserve requirements were consolidated through *Circulares* nos 3.426 and 3.427 of 19 December 2008.

[12] CMN Resolution no 3.656 increased the limit of asset purchases by the FGC from 20% to 50% of equity.

This comprehensive set of measures, adopted in a sequential way, succeeded in ending the liquidity squeeze, favouring a credit recovery, initially to households and later to corporates. The re-acceleration of credit also benefited from actions by state-owned banks, which gained market share during the crisis. This increase in market share was first seen on the liability side (as state-owned banks enjoy a de facto government guarantee) and later on the asset side – large public sector banks accounted for 34% of total credit by June 2009, compared with 28% by August 2008. It should be noted that the increased role of the state in the financial sector, in the aftermath of the 2008 panic, was not unique to Brazil.

Conclusion

Several lessons can be drawn from the Brazilian experience during the financial crisis. With regard to monitoring and prevention, it is clear that the trading of derivatives should, as far as possible, be confined to organised exchanges rather than over-the-counter (OTC) in order to prevent problems such as those faced by Brazilian non-financial corporates from remaining hidden for too long. Intra-agency cooperation should also be strengthened, whether between central banks and securities supervisors within jurisdictions or between central banks in different jurisdictions.

In relation to liquidity management in local currency, the Brazilian experience shows that, although costly in terms of systemic efficiency over the medium-term, reserve requirements can be an extremely effective and flexible policy tool in crisis scenarios. However, the lack of demand for discount window operations highlights the importance of the stigma issue and shows that liquidity auctions, in the form of the Federal Reserve's Term Auction Facility (TAF) could also be important additional tools. The crisis also highlighted the importance of broadening the range of institutions that are eligible to borrow from the central bank – including the FGC and systemically important clearing houses.[13]

The crisis showed that having adequate buffers of foreign exchange reserves is very important: it enabled the BCB to restore liquidity conditions in the foreign exchange market while allowing the exchange rate to adjust to changing fundamentals. Moreover, having reserves enabled the BCB to enter a currency swap arrangement with the Federal Reserve, which helped to contain currency volatility. Having adequate reserves allowed the BCB to mitigate a "double drain" scenario, characterised by liquidity squeezes in foreign and local currency.[14] Additionally, self-reliance, rather than reliance on shared reserves, proved useful in a crisis situation in which timely action was essential. The crisis also showed that direct intervention in derivatives markets, if they become dysfunctional and start affecting price-setting in the spot market, may be quite effective.

Finally, we note that the crisis was not a failure of inflation targeting. Rather, it was a failure of bank and financial supervision in some mature economies, not all of them practitioners of inflation targeting. Economies such as Brazil which, under fully fledged inflation targeting, adopted prudent monetary policies and conservative prudential rules, were hit by the crisis at a late stage, emerged faster from it and saw smaller and less persistent deviations from the price stability objective. This is another important lesson from the crisis.

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[13] This last provision is included in a draft legislative proposal that the BCB placed in public consultation in October 2009.

[14] Obstfeld, Shambaugh and Taylor (2008) formalise the "double drain" concept.

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