
Some Lessons of the Global Financial Crisis from an EME and a Brazilian Perspective

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Introduction: Progress and Conundrums after the Global Financial Crisis

I would like to give an emerging market economy (EME) perspective for this session on capital flows, exchange rate management, and capital controls, or, to use current terminology, capital flow management.¹ I don't want to oversimplify, but let me suggest that, for many of us, the global financial crisis incited feelings of *déjà vu*: what was happening with the advanced economies was very much what we had experienced and learned about large debt-financial crises, putting aside size and scope.

From this angle, I see some progress in many ways. The global financial crisis had a lax regulatory component at its origin,² which we in EMEs were quite familiar with from our past experiences with bad origination, high debt, and currency mismatches. To some extent the crisis validated many aspects of the pragmatic policy framework that EMEs in general and Brazil in particular had been using to ensure macroeconomic and financial stability in our countries. This framework allowed us to conduct monetary policy with independence even in an increasingly financially globalized and interdependent world. The crisis also showed the importance of quickly unleashing countercyclical policies to respond to a severe collapse in confidence, using extreme, though necessary, versions of highly expansionary policies (e.g., including fiscal and unconventional monetary policy [UMP] actions). In EMEs in particular, we knew that too, and for the first time we had some (fiscal and monetary) room to join the collective G-20 countercyclical effort. And we also understood how to pragmatically manage the spillover effects of UMP while maintaining our

macrofinancial frameworks (through an inflation-targeting and flexible exchange rate regime) and preserving our stability.

Having said that, I do not necessarily see confusion but conundrums. Why did such massive stimuli deliver so little growth in advanced economies? Why are we debating whether we are just on a “plateau,” waiting for a new growth cycle, or are in a “secular stagnation” desert? Did we underestimate (1) the “balance sheet” effect of a high-debt crisis, with its effect of weakening both credit multipliers and financial accelerators; (2) the political economy, which can complicate (to say the least) any coordination between monetary and fiscal policies; (3) a “structural change” in labor markets, which affects traditional Phillips curves; or (4) changes in the postcrisis value of key parameters of central bank reaction functions, such as the nonaccelerating inflation rate of employment and the neutral interest rate?

I do not try to solve these puzzles and will concentrate my remarks on lessons to be drawn from the crisis from an EME and more specifically Brazilian perspective for capital flows, exchange rate management, and capital flow management. I will deal essentially with how we developed a pragmatic policy framework to address sudden stops and sudden floods of foreign capital while maintaining an independent monetary policy aimed at macro and financial stability.

How Did EMEs End Up with a Pragmatic Policy Framework? Learning from Our Typical Crises of the 1990s

The global financial crisis exhibited many familiar analytical features for EMEs and for Brazil in particular, because of our currency-financial crises of the 1990s. These crises spawned a large body of literature that pointed regularly to a perennial problem of policy inconsistency. In many cases, the local political economy leaned toward macropopulist policies³ that expanded domestic absorption to unsustainable levels in order to grow faster or accommodate conflicting demands over the budget and resources in general. Whether the component of aggregate demand driving the excess was consumption (Latin America) or investment (Asia), both cases ended in a debt crisis, a banking crisis, a currency crisis, and high or even hyperinflation. The severity of the ensuing crisis naturally depended on other features, such as fiscal profligacy, financial fragility,

available reserves vis-à-vis forex liabilities under the chosen exchange rate regime, and other institutional characteristics, such as various forms of indexation, monetization of deficits, and different ways of conducting monetary policy. Despite significant differences between emerging and advanced economies in governance, institutions and income per capita, from a macroeconomic perspective there are some resemblances (e.g., financial exuberance and intra-euro-zone bank credit flows in the wake of interest rate convergence, neglect of self-imposed fiscal thresholds and debt ceilings, quasi-fiscal guarantees for the housing sector to enhance social inclusion).

In the case of EMEs, naturally the first step after the 1990 crises was to limit fiscal and parafiscal excesses, especially in countries with several layers of government (and thus of debt). That step implied, first, prohibiting monetization of deficits, privatizing, and relying on rules (of law) and less on discretion. In parallel, monetary policy lessons were learned,⁴ and most EMEs moved their policy frameworks from money targeting to exchange rate targeting and then to inflation targeting. An important part of the lesson was also to understand the macrofinancial dangers of destabilizing external shocks for fixed or even pegged exchange rate arrangements for EMEs and progressively adopting a flexible exchange rate regime.⁵ That went, *pari passu*, with understanding that capital flows to EMEs are essentially procyclical, and therefore that prevention is better than cure: to avoid the typical confidence-crisis triggering à la Calvo “sudden stops,”⁶ we came to the logical conclusion that we needed stronger fundamentals, sound macrofinancial policies, and buffers of self-insurance to pursue our own development strategies in a stable and sustainable way if we wanted to make good use of foreign savings. Naturally, in some EMEs, there were various idiosyncratic contributing factors, some related to the significant improvement in our terms of trade owing to the commodity supercycle. That allowed some EMEs (Brazil is a case in point) to accumulate reserves, become net creditors, and significantly reduce their risk premia to the point of becoming investment grade and a destination of sizable portfolio and direct investment flows.

But when facing distrust and crisis, many EMEs came out of these episodes with a sobering and pragmatic way to face the challenges of the new global world or, in other words, to “manage the impossible trinity.” In essence, the pragmatic option was to: adopt a floating exchange rate

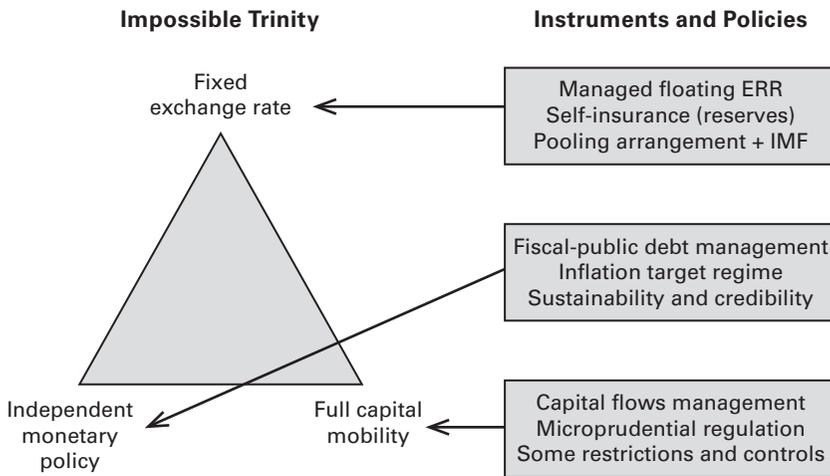


Figure 22.1
The Impossible Trinity, and Instruments and Policies to Manage It.

as a first line of defense against external shocks; to keep debt, especially public debt, within reasonable limits—if possible—through legal explicit rules; and to control inflation by implementing a credible monetary rule, in many cases using an inflation-targeting framework. The “pragmatism” consisted in building (some) self-insurance and/or using multilateral liquidity when need be, and, if foreign exchange global markets were excessively jittery, to smooth volatility in local foreign exchange markets. The combination of these textbook plus pragmatic policies and regimes proved adequate to build policy credibility and maintain fiscal and external sustainability.

Why, Like Almost Everybody Else, Did We Underestimate the Global Financial Crisis? What Have We Learned from It?

Well, we underestimated because the gray area in this pragmatic framework was how to combine financial stability with the “divine coincidence” of output-price stability.

It was assumed that, as a complement to using the pragmatic framework outlined above, using a set of microprudential regulations, that is, rules that would apply to each individual financial institution, would enable the financial system as a whole to remain stable. Under average financial conditions that might have been true. Another way to explain

this underestimation of systemic financial risk is to remember the benign neglect with which we brushed aside some precrisis warning signals of trouble (e.g., “global imbalances,” “irrational exuberance,” “asset-price booms,” etc.).

In any event, major novelties emerged in the last couple of decades that had positive and negative (risky) aspects for exacerbating financial cycles:⁷ (1) the financial system became larger in size, much more global and interconnected; (2) financial globalization spread and, while allowing larger local imbalances to get financing globally, it also made it possible to accept pusillanimous attitudes toward debt (“this time [seems always] different” but never is);⁸ (3) financial innovation improved risk metrics, created new products, and facilitated financial outreach, but it also allowed more opacity to grow unnoticed in large, interconnected balance sheets of globalized, too-big-to-fail financial institutions; and (4) prolonged periods of very low short-term interest rates and very moderate inflation seemed to confirm our full control of the business cycle but also enticed to take more risk with more leverage and less capital.

In a nutshell, the global financial crisis left all of us with the following questions or lessons:

1. Financial regulation and supervision cannot simply focus on individual firms’ conduct and risk and need to adopt a macroprudential perspective to identify weaknesses in the financial system as a whole and mitigate systemic risk.
2. Low and stable inflation does not, by itself, guarantee financial stability. The logical next question is whether central banks need to rethink their role in preventing the buildup of systemic risk and financial imbalances.
3. If central banks do need to rethink their role, should monetary policy respond to (some measure of) financial (in)stability; should we revisit the (old) debate of “leaning against” the financial cycle versus “cleaning up after” asset bubbles burst, and what metric of financial (in) stability should be considered an early warning indicator (e.g., asset prices)?

The postcrisis reflection⁹ seems to go in the direction of a “new normal” and another “pragmatic” framework: in order to address macro and financial stability objectives, monetary and macroprudential policy are independent, but can act in a complementary, coordinated way with their

respective instruments to achieve price and financial stability. Although a kind of “divine coincidence II” between macro and financial stability objectives does not seem to exist, under a “new normal” regime, either a single unified authority or two different authorities can act, effectively combining demand management policies with macro- or microprudential tools to achieve macrofinancial stability.

In particular, the G-20, the Financial Stability Board (FSB), and the Bank for International Settlements (BIS) made a significant effort to address the excessive procyclicality of bank lending behavior that tends to exacerbate exuberance. This effort led to the idea and implementation of countercyclical regulatory instruments (e.g., countercyclical capital requirements, maximum leverage ratio, minimum liquidity requirements, and more stable medium-term funding ratios) that would prevent or limit global/local financial cycles by making procyclical behavior more costly, owing to the need to raise more capital or to keep more liquid assets on balance sheets, or both.¹⁰

How EMEs Enhanced Their Pragmatic Policy Framework with Macroprudential Tools: The Brazilian Experience

Therefore, in addition to the behavior of bank lending in general, for EMEs the global financial crisis did pose specific and more complex issues of macrofinancial stability. We were used to managing an “old normal” of “sudden stops” of capital flows. Now we had to learn how to maintain macrofinancial stability under a “new normal” situation of sudden floods of capital flows. In other words, we needed to learn how to avoid the transmission of external exuberance into our local asset and credit markets by combining monetary policy and macroprudential tools and using, when needed, capital flow management instruments?

Indeed, depending on the nature of shocks, the scope for using monetary policy may be limited, with the additional “pulling effect” of monetary policy in the case of sudden floods of capital. That might represent a serious issue for EMEs as these flows are often a cause of macroeconomic and financial instability.¹¹

The problem is not capital flows per se, it is their volume and intensity. When volume and intensity are too much, they can lead to excessive credit expansion, lower quality of credit origination, increased financial

system exposure to exchange rate risk, asset price distortions (including excessive exchange rate appreciation), and even inflationary pressures (if the inflationary effects from the boom in aggregate demand surpass the opposite effect stemming from exchange rate appreciation). Easy global money can boost domestic demand in whatever policy stance the economy might need to be; it amplifies expansion beyond what you might desire; you might have then to slow down expansion sooner than envisaged; the “party gets too wild too soon.” And when you get this “feeling good” mind-set, it complicates even further your domestic political economy (sometimes already complex even without easy money); that means it hampers your capacity to slow down the party with policy instruments that depend on political cycles; this is for all countries, advanced and emerging economies alike. Then, if you tighten monetary policy, it might exacerbate short-term inflows and compound potentially destabilizing forces in domestic asset markets.¹² It is a threat to financial stability; and in particular, the collateral effects of UMP in EMEs was real exchange rate appreciation, a widening of current account deficits, a more rapid credit and monetary expansion, and asset-price pressures, as occurred, for example, in Brazil.¹³

The Brazilian experience might be useful to illustrate how we enhanced our pragmatic policy framework by means of the following measures: (1) keeping an independent monetary policy and acting accordingly to address domestic inflationary pressure; (2) strengthening the robustness of our financial system, that is, making sure it was well capitalized, liquid, and well provisioned; (3) using macroprudential tools to avoid excessive domestic credit growth; (4) using foreign exchange interventions to smooth volatility and provide a foreign exchange hedge to our domestic firms; and (5) now that we approach the full exiting of UMP (with the prospects of a forthcoming rate rise in the United States), strengthening our policies to sail through this last phase of the crisis.

During the phase of large inflows in 2011–2012, corresponding to the beginning of the Federal Reserve’s asset-purchase programs or quantitative easing (QE) in the United States¹⁴ and massive capital inflows into Brazil, we used a combination of monetary policy and macroprudential tools to tighten capital rules. These measures aimed at calibrating consumer credit growth (e.g., asking for more capital for some consumer loans, lowering loan-to-value ratios, and hiking reserve requirements).

Hence, our large capital inflows were “managed” through price (dis)incentives and not through typical quantitative controls. It remains, however, an important policy issue for both emerging and advanced economies whether periods of excessive inflows need to be addressed by a combination of monetary, fiscal, and capital flow management policies. As mentioned earlier, in building the European monetary union, perhaps massive intra-euro-zone bank credit flows into peripheral European countries could have been moderated by applying capital flow management instruments and macroprudential tools, given that after the euro, monetary policy was unavailable at the country level, and the fiscal position of some countries was already prudent. It remains to be seen whether it would have produced less debt and avoided the crisis at all. In any event, in Brazil, we also enhanced the monitoring of household indebtedness and raised reserve requirements to reduce excessive bank exposures in foreign exchange. These rules were eventually relaxed when we had to turn to the next phase of the global financial crisis.

The next phase began when the Fed started communicating in May 2013 that it could start moderating its assets repurchase program. Global financial markets became more volatile, and there was a repricing of risks, sometimes leading to a sell-off of EM assets. As usual, market perceptions of EMEs seemed to have shifted more than fundamentals might have warranted: the optimistic view of the immediate postcrisis rebound was replaced by a gloomy pessimism. However, by the end of 2013, and since then, the tapering took place and there was a significant improvement in sentiment and more cautious and detailed communication, including about the next logical steps by the Fed, which would be the timing of the beginning of rate movements. There too, the general sense is that the full exit from UMP with a rate increase, at the appropriate time, is a welcome transition to a more normal global monetary policy condition. Since that would be a result of economic recovery in the world’s largest economy, it shall be a net positive for EMEs, which will benefit, including through global trade.

In Brazil, in addition to our experience with sudden stops, sudden floods, and improved fundamentals, we prepared ourselves for this transition. In particular, we designed and implemented a foreign exchange intervention program to provide timely and ample hedge to mitigate financial risks arising from monetary policy normalization in the United States.

The program was adopted in August 2013 and functions essentially by selling currency-derivative swaps that are settled in domestic currency.¹⁵ It was last renewed in December 2014 until March 31, 2015, when it was not extended. However, all swaps expiring after May 1, 2015, will be rolled over. The program was successful in preserving financial stability by providing a foreign exchange hedge to private agents. Approximately 80 percent of the stock of swaps is allocated in nonfinancial companies. The total amount supplied by April 2015, approximately the equivalent of US \$114 billion, corresponded to about 30 percent of our foreign exchange reserves.

Finally, we are now entering the (hopefully final) phase of the global financial crisis, where we expect episodes of greater volatility in the wake of normalization of monetary policy rates, especially in and beginning with the United States. Whether one anticipates a Fed rate-hiking scenario similar to that in 1994 (less orderly in terms of how short-term rates transmitted to longer-term rates) or in 2004 (more orderly), and irrespective of efforts by the Federal Open Market Committee to communicate its policy stance and prepare markets as well as it could, the textbook recipe is to strengthen policies. And our framework is precisely being strengthened. Brazil sailed well through the crisis, but the intensity and duration of our fiscal and parafiscal countercyclical responses during the last couple of years resulted in typical twin imbalances (e.g., of current account and fiscal deficits), signaling excessive domestic absorption. That eventually caused public debt ratios to deteriorate, put rating agencies on alert, and affected private-sector confidence. Early in 2015, Brazil addressed these challenges with (1) a double adjustment in relative prices (i.e., a realignment of administered prices vis-à-vis the consumer price index and external prices vis-à-vis domestic prices through the exchange rate) and (2) a consistent set of fiscal tightening measures, which include the reduction of current fiscal and parafiscal expenditures, the elimination of subsidies, realignment of public utility charges, and more structural measures that are being put in place; the measures have the objective of sending public debt on a declining path in the medium term. Last but not least, Brazil's central bank has been tightening monetary policy to ensure the convergence of inflation to target by the end of 2016, as the role and objective of monetary policy is to contain the second-order effects resulting from these relative prices adjustments, circumscribing their impact to 2015 and

anchoring inflation expectations going forward in medium- and longer-terms horizons.

Conclusion: A Pragmatic Framework Is at Work in This (Last?) Phase of the Crisis

With the benefit of hindsight, the global financial crisis revealed that both mature and developing countries, advanced and emerging economies, despite obvious differences in institutional maturity, could have crises with similar ingredients: too much financial exuberance, too much debt, inconsistent exchange rate regimes, lax fiscal policy, lax monetary policy, lax regulations, poor governance, a political economy favoring unsustainable expansionist policy stance, and so on.

Like many EMEs, but with a stronger prudential and regulatory differential, we developed in Brazil a pragmatic policy framework, building on our experience with our past crises of the 1990s and strengthening it with standard policies to ensure price stability (an inflation-targeting regime) and fiscal responsibility laws (a set of rules to control public debt). We also adopted a flexible exchange rate as a first line of defense against external shocks.

Our framework sailed well through the various phases of the global financial crisis and proved resilient. We are testing it again in this period of normalization of monetary conditions in the United States. Are there any general lessons?

First, one should keep the “old pragmatic framework” as strong as possible (e.g., the flexible exchange rate regime, the sound fiscal stance generating low levels of indebtedness, a strong inflation-targeting framework). And work as hard as possible against the powerful tendency to accommodate political economy pressure with more debt. It is difficult to ensure financial stability in the absence of confidence in long term fiscal stability. Local political economy factors can create or exacerbate volatility that eventually threatens the overall macroeconomic stance.

Second, a solid financial system is needed, an intrusive supervision with the relevant and timely information (market infrastructure) about vulnerabilities so that the regulator can act preemptively. Indeed, we rely on the robustness of our financial system. The Brazilian financial system is well capitalized and liquid, and provisions are high. Our financial

system has a historically low default rate and is very resilient to variations in the exchange rate. There is low reliance on cross-border financing. Foreign currency debt is also low and the bulk of it is hedged through exports, assets held abroad or financially hedged. We had already a number of stringent microprudential regulations and an intrusive supervision of our financial system that ensured its resilience and health (e.g., above Basel minimum capital requirements, a high level of liquidity and provisions, and very detailed market infrastructure with mandatory reporting of financial transactions and trading through CCPs).

Third, it is important to communicate well the separation principle that ensures that each policy objective will be addressed by one policy instrument, even if there could be—and indeed there often is—*ex post* complementarity between them. Macroprudential tools are geared to address financial stability and monetary policy price stability, but such tools do influence the transmission of monetary policy. Understanding separation with complementarity helps to strengthen the rationale and the credibility of the policy framework as a whole.

It seems that both the practical experience of some EMEs (and Brazil) and the new analytical work that has been testing policy responses to external shocks, simulated by dynamic stochastic general equilibrium modeling with the financial sector, using both monetary policy and macroprudential tools, suggest promising ways to design a consistent approach to achieve macroeconomic and financial stability.¹⁶

A summary of these features is shown in figure 22.2.

Fourth, while keeping the floating exchange rate regime as a first line of defense, it is useful to smooth excessive exchange rate volatility, which can affect the financial stability of the system. There are many avenues to achieving that, depending on the characteristics of your foreign exchange markets, but using directly or indirectly some combination of self-insurance (e.g., international reserves) and access to multilateral protection seems to be efficient.

Fifth, maintaining macroeconomic and financial stability is necessary, but working on your growth potential through structural reforms is paramount. Not only does it strengthen solvency ratios and fundamentals, it also allows more room to maneuver for social improvement, which in turn affects positively the stability of institutions and social welfare.

	Macroeconomic Stability (Activity / Inflation & Financial)			
Policy Areas	Price Stability	Debt Stability	Financial Stability	
	Monetary Policy	Fiscal Policy	Macroprudential	Exchange Rate
Policy Instruments	Place central bank rate policy under clear arrangement (flex IT, etc.) to manage activity/inflation and anchor expectations	Identify short-term credible fiscal targets to stabilize (gross, net) public debt-to-GDP; medium-long-term public debt management	Reduce excessive procyclicality, i.e., smooth financial accelerator and credit multiplier; reduce "excesses" in prices and quantities	Use floating as first line of defense; reserves accumulation for self-insurance; FX intervention to avoid excessive volatility; FX hedge program to strengthen financial stability, etc.

Figure 22.2
Macroeconomic Stability (Activity/Inflation and Financial).

Notes

1. This session at the 2013 "Rethinking Macro Policy II" conference focused on the importance of the choice of an adequate exchange rate arrangement for EMEs and the role of macroprudential instruments and capital controls in mitigating the effects of global excessive liquidity. See George Akerlof, Olivier Blanchard, David Romer, and Joseph E. Stiglitz, eds., *What Have We Learned? Macroeconomic Policy after the Crisis* (Cambridge, MA: MIT Press, 2014).
2. Alan S. Blinder, *After the Music Stopped* (New York: Penguin Press, 2013).
3. See Rudi Dornbusch and Sebastian Edwards, eds., *The Macroeconomics of Populism in Latin America* (Chicago: University of Chicago Press, 1991).
4. Jeffrey Frankel, "Monetary Policy in Emerging Markets," in *Handbook of Monetary Economics*, vol. 3B (Amsterdam: North-Holland, 2011), 1439–1520.
5. Frederic Mishkin, *Monetary Policy Strategy* (Cambridge, MA: MIT Press, 2007), esp. chap. 17, "The Dangers of Exchange Rate Pegging in Emerging Market Countries," 445–463.
6. Guillermo A. Calvo, "Capital Flows and Capital-Market Crises: The Simple Economics of Sudden Stops," *Journal of Applied Economics*, November 1998.
7. Claudio Borio, "The Financial Cycle and Macroeconomics: What Have We Learnt?," BIS Working Paper 395, Bank for International Settlements, December 2012.
8. Kenneth Rogoff and Carmen M. Reinhart, *This Time Is Different: Eight Centuries of Financial Folly* (Princeton, NJ: Princeton University Press, 2009).

9. See IMF, “Key Aspects of Macroprudential Policy,” June 10, 2013, <http://www.imf.org/external/np/pp/eng/2013/061013b.pdf>, and IMF, “The Interaction between Monetary and Macroprudential Policies,” January 29, 2013, <http://www.imf.org/external/np/pp/eng/2013/012913.pdf>; Olivier Blanchard, David Romer, M. Spence, and Joseph E. Stiglitz, eds., *In the Wake of the Crisis: Leading Economists Reassess Economic Policy* (Washington, DC: IMF; Cambridge, MA: MIT Press, 2012).

10. See, among others, for the CCCB, Mathias Drehmann, Claudio Borio, Leonardo Gambacorta, and Gabriel Jiménez, “Countercyclical Capital Buffers: Exploring Options,” BIS Working Paper 317, Bank for International Settlements, July 2010; and Basel Committee on Banking Supervision, Consultative Document: “Countercyclical Capital Buffer Proposal,” issued for comment by September 10, 2010, Bank for International Settlements, July 2010.

11. See Rhaguran Rajan, “Competitive Monetary Easing—Is It Yesterday?,” speech at the Brookings Institution, Washington, DC, April 10, 2014; Hélène Rey, “The Global Financial Cycle and Monetary Policy Independence,” paper presented at the Federal Reserve Bank of Kansas City 2013 Economic Policy Symposium, “Global Dimensions of Unconventional Monetary Policy,” Jackson Hole, WY, August 24, 2013; and Pierre-Richard Agénor, Koray Alper, and Luiz A. Pereira da Silva, “Sudden Floods, Macroprudential Regulation and Financial Stability in an Open Economy,” *Journal of International Money and Finance* 48 (2014): 68–100.

12. In 2010 alone, EM and developing economies received almost US \$225 billion in net portfolio flows. This was more than double the already very strong portfolio flows received in 2007, just before the crisis, and can be compared to an average level of net portfolio flows below US \$20 billion earlier in the decade.

13. See M. S. Mohanty, “Overview,” in “The Transmission of Unconventional Monetary Policy to the Emerging Markets,” BIS Paper 78, Bank for International Settlements, September 2014; or João Barata, Luiz Awazu Pereira da Silva, and Adriana Soares, “Quantitative Easing and Related Capital Flows into Brazil: Measuring Its Effects and Transmission Channels through a Rigorous Counterfactual Evaluation,” *Journal of International Money and Finance* 48 (2014): 68–100.

14. See Luiz Awazu Pereira da Silva and Ricardo Eyer Harris, “Sailing through the Global Financial Storm: Brazil’s Recent Experience with Monetary and Macroprudential Policies to Lean against the Financial Cycle and Deal with Systemic Risks,” in *Managing Capital Flows: Issues in Selected Emerging Market Economies*, ed. Bruno Carrasco, Subir Gokarn, and Hiranya Mukhopadhyay (Mandaluyong City, Philippines: Asian Development Bank; Oxford: Oxford University Press, 2014), chap. 7.

15. Instead of using classic sterilized interventions, we implemented the largest intervention foreign exchange program of any EME not by selling directly US dollars to buy domestic currency (the BRL) but by selling currency-derivative FX forward. These currency-derivative swaps are not settled in US dollars but in BRL.

The contract between the central bank and dealers pays the difference between the BRL/USD foreign exchange rate at the beginning of the contract and the actual foreign exchange rate at the end, plus a dollar-linked on-shore rate of interest. In return, the central bank receives the cumulative overnight interbank rate for the period of the contract, in BRL. Therefore, the central bank is insuring buyers against BRL depreciation with no direct use of USD reserves. The dealer can be either a bank that resells the contract to an end-user or a financial institution itself.

16. For a review of EMEs approaches on this issue, see Pierre-Richard Agénor and Luiz A. Pereira da Silva, “Inflation Targeting and Financial Stability: A Perspective from the Developing World,” CEMLA and IDB, 2013. <http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=38367231>.