Lender of last resort: actions, results and lessons from Mexico's experience during the crisis

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Abstract

The note describes the process of contagion from the International Financial turmoil to domestic markets, the transmission mechanism through the FX market, and how the high volatility of the foreign exchange rate became a risk to financial stability. It explains the dependency of the Mexican financial system on the ability of markets to work without disruption. The main actions taken by policy makers to restore stability to the system are outlined and reviewed. The last section provides the author's assessment of the effectiveness of the different actions taken, the tools used and lessons learned.

Keywords: Foreign exchange rate, interbank lending, liquidity, systemic risk, central bank interventions, FX swaps, lender of last resort

JEL classification: E58, F42

I. Introduction

The lender of last resort function has attracted little enough notice in the literature over past decades. The recent financial crisis, however, has reminded us just how important the function is for central banks. It has also called attention to how difficult it is to achieve the necessary balance between preserving financial stability and avoiding increased moral hazard by removing credit risk decisions from private markets. These challenges add considerably to the fascination of central banking as a profession.

Some background on the economy and financial markets is needed to give context to the actions taken by policymakers during the crisis in support of the financial system and the tools they used in carrying out the LOLR function.

By the end of the third quarter of 2008, the Mexican economy enjoyed strong macroeconomic fundamentals. It had a relatively small public deficit, a low ratio of government debt to GDP, and significant foreign exchange reserves. The financial system was sound. Banks held high capital ratios of 15–18%, with healthy credit portfolios and almost no toxic assets. Shadow banking accounted for only a small portion of financial intermediation, and it was confined to non-banks supplying mortgages, home-building credit and auto loans. All financial markets were functioning without disturbance and enjoyed ample liquidity. There were no imbalances within the perimeter of applicable regulation, or any asset price bubbles.

However, Mexico is a small open economy. Trade comprises over two thirds of GDP, and the capital account is completely open under a floating exchange rate regime. Thus, the country is very much exposed to international shocks, in particular those coming from the United States.

After the collapse of Lehman Brothers, there was an immediate increase in investors' risk aversion, leading to massive capital outflows from emerging markets. Indeed, it was precisely through the forex market that the contagion from the international market turmoil was transmitted to the Mexican financial system.

ELA: Emergency liquidity assistance

Fed: US Federal Reserve

Forex: Foreign exchange

IMF: International Monetary Fund

LOLR: Lender of last resort

MMLR: Market-maker of last resort

NAFTA: North American Free Trade Agreement

USD: US dollar

The peso suddenly fell by almost 25%, a depreciation that was warranted as it emerged that the country's terms of trade would soon deteriorate. Looming on the horizon were lower exports to the US of both manufacturing goods (which account for 80% of total revenue) and of oil. In addition, less income was foreseen from workers' remittances (a large proportion of these workers being involved in the US construction industry), and a severe drop in tourism income was expected due to the outbreak of the AH1N1 pandemic. Moreover, all sources of foreign financing seemed to be closed as international markets became completely illiquid. However, even after the massive depreciation of the currency, high volatility prevailed, fuelled by an unusually large demand for dollars from significant domestic corporations.

As it turns out, several large Mexican corporations had engaged in highly leveraged derivative operations that generated short dollar positions which grew exponentially along with the peso's depreciation. These positions triggered recurrent and significant losses to corporates, leading to dollar demand that further pushed currency depreciation, in turn driving more demand for dollars. Exchange rate volatility became a matter of public concern and fuelled even more negative expectations for the future value of the currency. The adverse dynamics of the exchange rate became a systemic risk for the financial system and for the real economy.

Furthermore, as domestic investors realised that important corporations were in financial distress, panic spread because these firms had issued large amounts of commercial paper on domestic and international markets. Consequently, the Mexican debt markets saw massive asset sales and a flight to high-quality assets, mainly domestic treasury bills. Commercial paper market and money market mutual funds were hit particularly hard. Although no money market mutual fund "broke the buck", investors, after seeing what was happening in other countries, immediately started withdrawing in large numbers. Soon afterwards, all domestic financial markets suffered from contagion. Trading in the commercial paper market practically ceased, the interbank market was severely impaired, and the markets for government bonds and quasi-government paper (bonds issued by the government to pay for the 1994 banking crisis) became illiquid.

Mexican banks, especially those owned by foreigners, immediately reduced their counterparty risk exposures. Although most banks had no liquidity problems, a handful of small niche banks were completely dependent on interbank markets for funding. These banks experienced severe liquidity constraints.

The failure of the interbank market to supply funding to the small banks (caused to a large extent by the industry's extreme risk aversion) became a real threat to financial stability. By the last week of October 2008, the whole financial system faced significant liquidity pressures, and high volatility prevailed in most of the domestic financial markets.

Moreover, some foreign banks even required their Mexican subsidiaries to provide funding to head offices as the disruption of the interbank markets in advanced economies led to an increase in demand for liquidity from any source, including emerging market countries. As documented by the central bank, the net exposure of banks domiciled in Mexico with foreign counterparts increased significantly in 2008 and 2009.

II. The institutional setting prior to the crisis

Domestic currency

The Bank of Mexico provides daily liquidity to the system through open market operations. After the market closes, a standing facility is open from which any bank can borrow at a high penalty rate. Banks borrow from the facility if they are unable to meet their daily liquidity needs through open market operations during business hours. Therefore, the recurrent use of this facility does come with some stigma attached to it.

The LOLR function was carried out at the full discretion of the central bank. Although the Bank of Mexico's governing Board has the legal authority, internal protocols, and rules and regulations to implement the function, the Bank chose not to make these factors public. Instead, the LOLR function was conducted with "constructive ambiguity".

Foreign exchange market

Since the adoption of the flexible exchange rate regime, the Bank of Mexico has tried to avoid direct interventions in the market. However, bouts of international financial turmoil, such as the Brazilian, Russian, and Asian crises, severely reduced liquidity in the forex market, resulting in very high volatility. Under those circumstances (high exchange rate volatility together with a sudden change in risk aversion leading to market instability and posing a risk to the domestic financial system), the Bank intervened. In order to provide liquidity, the Bank of Mexico pre-announced to the market that it would conduct a daily auction of US$200 million with a minimum price equal to the previous day's closing rate plus 2%. The objective was not to defend any particular exchange rate level, but to mitigate volatility by offering some dollars at times when the supply had suddenly stopped. This mechanism, however, was not in place at the moment Lehman Brothers collapsed.

The central bank, under the mandate of the Exchange Commission,[1] accumulated a significant amount of foreign exchange reserves, equivalent to 8% of GDP, incurring high costs. In spite of the fact that Mexico has a free-floating exchange rate regime, the level of international reserves then was regarded by some rating agencies as insufficient when compared with the levels of other countries.

The Bank of Mexico had currency swap arrangements in place with the Federal Reserve System and the Bank of Canada to support the level of its international reserves. The swaps had been in place with these countries for many decades and were renegotiated with the signing of NAFTA in 1994. However, they were more a sign of good will and cooperation among the financial authorities of the three

[1] The Exchange Commission determines the foreign exchange regime and has the authority to decide the level of forex reserves. It is composed of six members, three from the central bank and three from the Finance Ministry. Should a tie occur after a vote is cast, the final decision is made by the Finance Minister.

countries than an effective mechanism to supply foreign currency to the Bank of Mexico.

Strong macroeconomic fundamentals, a sound domestic financial system, high levels of international reserves, and swap arrangements were intended to protect the economy from contagion and to serve as a deterrent to speculative attacks.

III. Actions to provide liquidity during crisis

Foreign exchange market

As the financial crisis deepened, it became evident that the traditional automatic mechanisms that the Bank of Mexico had in place to supply liquidity were insufficient. The most pressing problem was in the forex market. It was imperative to address the very high volatility of the exchange rate to reverse negative public expectations for the future value of the currency. Thus, the central bank, as the MMLR, decided to supply a large amount of dollars to the market. For that purpose, the bank used several mechanisms: daily, pre-announced auctions with a minimum price were again put in place and increased twofold, to US$400 million. In addition, US$100 million were auctioned daily without a minimum price. Furthermore, extraordinary auctions of dollars were carried out whenever the central bank deemed it necessary, and direct sales were made to specific banks that were short of liquidity. Market interventions during the crisis were massive and drained significant international reserves from the central bank. In the course of its actions, the Bank made it clear to the market that it was not defending any specific level of the exchange rate and that all such operations were fully sterilised. Domestic currency liquidity issues were dealt with by other means.

BoM USD sales in the open forex market, 8 October 2008–31 December 31 2009

(Billions of US dollars) Table 1

Type of intervention	2008	2009	Total
Extraordinary auctions	11.00		11.00
Auctions with minimum prices (2%)	4.18	4.16	8.34
Unconditional auctions		10.25	10.25
Discetionary sales		1.84	1.84
Total	**15.18**	**16.30**	**31.41**

Notes: See BIS Working Paper No 429.

Sources: Bank of Mexico.

Although the massive forex interventions were successful in stabilising the market, as soon as the public realised that international reserves were rapidly falling, the use of reserves became a matter of concern. The announcements that the Federal Reserve had provided Mexico with a currency swap line worth US$30 billion, and the IMF a flexible credit line for US$50 billion were meaningful developments for market participants. Importantly, the support of the Fed and the IMF increased the resources available for foreign reserves by 100% and sent a powerful message to investors that the country was carrying out sound economic and financial policies.

To provide guidance to the public, the Finance Minister and the Governor of the central bank published a detailed, one-year forecast for the balance of payments. The announcement disclosed that the government had already hedged its oil revenues for the next 18 months.

Liquidity in local currency

As domestic financial markets became illiquid, some were completely impaired; they posed an important systemic risk and a potential threat to the effective implementation of monetary policy. To provide liquidity to debt markets, several measures were taken.

To restore market confidence, the central bank became MMLR in several local financial markets. Daily liquidity, provided by the Bank of Mexico through open market operations, was lengthened in maturity to mitigate interbank market pressures. To ease financial conditions, the central bank carried out several auctions to purchase long-term government bonds in pesos and bonds linked to the CPI. In addition, the Bank of Mexico became the buyer of last resort by engaging in direct purchases of quasi-government paper and offering swaps of fixed for floating interest-rate instruments.

The Treasury modified the structure of its regular weekly auctions. Issuance of long-term bonds was reduced sharply, giving precedence to short-term government bonds offered to investors eager for liquid, risk-free, peso-denominated assets.

To support the emerging mortgage-backed securities market, the Federal Mortgage Agency purchased a significant amount of these assets and extended credit to some of the main non-bank financial intermediaries.

The bank supervisor temporarily allowed money market mutual funds belonging to a financial group to be supported by the bank's parent. Such support was given either through purchase of the fund's paper or by bringing the entire fund to the bank's balance sheet. Pension funds were allowed to expand their risk-taking through a change in VAR methodology with a view to preventing fire sales.

To make credit readily available to banks, the Bank of Mexico opened a discount window facility from which any bank could borrow. The operating procedures, interest rates charged, the wide variety of assets accepted as collateral, haircuts and other information were made public, and banks were invited to use the window. All this was done in the expectation that banks that required liquidity would overcome their reluctance to incur a stigma by borrowing from the central bank.

Measures to restore credit

Government development banks actively granted credit to the most affected sectors of the economy, automobile manufacturing and housing.

Meanwhile, the Bank of Mexico, using the Federal Reserve currency swap lines, auctioned US$4 billion to the banking system so that the banks could offer dollar financing to their clients. Banks took US$3.2 billion in loans of up to 88 days.

IV. Lessons for Mexico in handling liquidity disruptions during the crisis

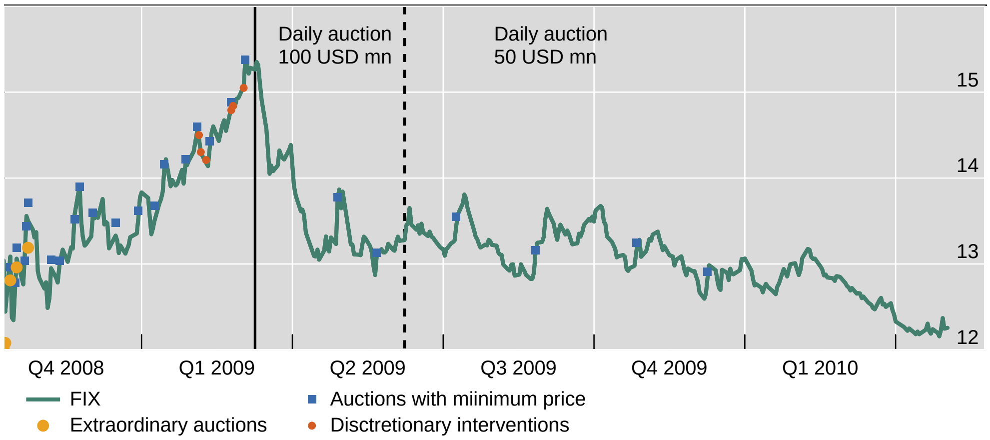
The global, system-wide nature of the recent crisis and trends in international and domestic financial development show how dependent modern financial systems are on the ability of markets to function without disruption. Of particular importance are the interbank, debt and derivative markets. Moreover, for emerging countries, in particular small open economies, disruptions in the forex market can rapidly become a risk to financial stability and to the real economy.

The dependence of financial system stability on market behaviour is so significant that it has changed the role of LOLR for many central banks. All around the world, monetary authorities have deviated from traditional doctrine in dealing with the recent crisis, abandoning the old paradigms that used to guide their policies.

Exchange rate and forex interventions

Mexican pesos per US dollar

Graph 1



The continuous black vertical line correspond to 09 March 2009, the dashed black vertical lines correspond to 08 and 09 June 2009.

Source: Central Bank of Mexico; author's calculations.

During the crisis, policymakers used several tools to support the financial system, with different degrees of success. The most effective were those aimed at resolving issues of illiquidity, both in foreign and domestic currency. In particular, the most pressing matter in mid-crisis was to restore confidence to the forex market in order to reverse public expectations of continued depreciation. The two most effective tools to cope with this problem were the role played by the Bank of Mexico as a credible MMLR in supplying a massive amount of foreign currency, and a good communications strategy – all in the context of strong macroeconomic fundamentals.

In domestic money markets, financial conditions were eased by reducing the duration of government paper held by the public and institutions via direct purchases of long-term government bonds, quasi-government paper and interest rate swaps. Direct bond purchases and interest rate swaps rapidly and effectively restored liquidity. The regulatory forbearance granted by the banking supervisor to temporarily allow the money market mutual funds that belong to a financial group to be supported by the bank's parent group prevented them from "breaking the buck" and helped the industry regain public confidence. In addition, the regulation issued by the pension funds supervisor temporarily allowing intermediaries to increased their risk-taking effectively prevented fire sales of assets, in particular sales of long-term paper.

The importance of coordination among the financial authorities cannot be understated – both local and international. At the local level, investors welcomed the support given to money markets by the coordinated actions taken by the Treasury, the central bank, and the banking and the pension funds supervisors.

Regarding international cooperation, the flexible credit line granted by the IMF not only provided real resources, but also gave support to the economic and financial policies undertaken during the crisis, and was an explicit recognition of the country's strong macro fundamentals and sound financial system. In this respect, the swap lines offered by the Fed sent an additional powerful signal to market participants as to the extent of the US commitment to backing up the Bank of Mexico by providing liquidity in US dollars, thus making the central bank a credible MMLR in the forex market.

On the other hand, traditional liquidity support, through open market operations or the discount window, was less effective. The former did not guarantee that those banks requiring liquidity from the central bank would get it, and the latter did carry the previously mentioned stigma, which continues to be a real problem. In addition, determining a systemically important institution carries the risk of time inconsistency.

The crisis highlighted the need to improve regulations governing liquidity, collateral, derivative operations and bank resolution procedures. It also underscored the additional work that is required to address liquidity provision during the resolution process of an international bank, where cross-border cooperation is necessary.

The LOLR function has changed for good, and the distinctions between monetary and financial stability functions are very difficult to discern in times of crisis. Thus, another important task is to be prepared to carry out the ELA function in a modern, market-dependent, interconnected global financial system. The Bank of Mexico should have the legal authority, the protocols and procedures ready to act as LOLR, MMLR and as buyer of last resort when responding to an emergency. The function of LOLR inevitability exposes the central bank to losses, and if they materialise, they should be covered by the Bank's capital or by a reduction in seignorage payments to the government. Since central bank losses are ultimately a fiscal issue, it is of the utmost importance to have risk-sharing agreements with the Treasury in case such an event occurs.

A transparent, consistent communications strategy proved to be an important tool in restoring confidence. Therefore, the central bank and all agencies involved in ELA should also be prepared to communicate and be accountable to public opinion for their actions. The central bank needs to reinforce its macroprudential surveillance, research, analysis and market intelligence capabilities in order to respond wisely to a crisis and to avoid overreacting and creating moral hazard.

Some lessons were learned with regard to crisis prevention. Domestic financial authorities have to make it a permanent task to improve upon the information provided to the markets. They have to ensure that the information required to assess credit risk is timely, comprehensive and accurate. Regulation perimeters must be frequently revisited as markets, operations and intermediaries evolve continuously. In addition, macroprudential regulations should be strengthened so that the emergence of black swans may be identified ahead of time. The globalised financial system poses additional challenges for crisis prevention, as the monitoring of global institutions and markets requires constant information-sharing. In order to achieve this objective, international cooperation among financial supervisors is needed.

I believe there is one lesson yet to be learned, relating to the conclusions from the cost-benefit evaluation of how the crisis was handled. The ELA provided to intermediaries and markets was effective in preventing a major disruption in the Mexican financial system. In spite of the fact that the fiscal costs were negligible, and that the central bank produced large profits, state intervention in the financial system modified the incentive structure for all participants. It remains to be seen if the benefits will outweigh the effects of moral hazard, which is the true cost of the actions that were taken.