Reserve management and FX intervention in Mexico

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Abstract

This note outlines Mexico's recent experience with three closely interrelated issues. First, on the basis of a legal framework regulating transactions in foreign currency between the central bank and government entities, and preannounced market-based mechanisms, the stock of international reserves has reached adequate levels. Second, interventions have been made to restore orderly operating conditions in the FX market whenever this has been needed, with satisfactory results and consistent at all times with the free-floating exchange rate regime in place. Third, the continuous improvement of standards and practices has been instrumental in achieving the objectives set for reserve management at the Bank of Mexico (ie liquidity, capital preservation and return enhancement).

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The Bank of Mexico's international reserves have increased significantly, although with fluctuations, in recent decades. The current stock, of around USD 179 billion, represents a tenfold increase from early 1997. At the same time, the level of reserves has remained roughly constant over the last three years. This is explained by a combination of factors.

Given the uncertainty regarding the optimal level of reserves, a tendency to err on the side of caution is desirable. In fact, evidence in the economic literature shows that large stocks of international reserves enhance an economy's resilience to external shocks, including through the diminished probability or cost of potential sudden stops of capital inflows.

Decisions by Mexico's Foreign Exchange (FX) Commission[2] regarding the level of the stock of international reserves, take into account a range of tests and metrics. However, in view of their varying nature and at times diverging results, these are used only as a reference and never as an explicit goal. In fact, no single metric is uniquely relied upon to gauge international reserves adequacy, thus rendering the FX Commission's judgment crucial in this task.

Reserve accumulation in Mexico has originated from two sources.

On the one hand, as per the Bank of Mexico's Law, all non-financial entities of the Federal Public Administration are required to operate with foreign currencies following the rules and policies set forth by the central bank, as well as to sell them directly to the latter under prevailing market conditions. Naturally, the motivation for such a requirement rests on those institutions' potentially large trade surpluses or deficits. Due to this regulatory framework, international reserves were sourced, for many years, to a significant extent from Pemex, the national oil company. The Federal Government has been another important driver of the international reserves stock.

On the other hand, when the level of reserves has been deemed insufficient, the FX Commission has resorted to a rules-based approach to buy US dollars from the market, in the form of preannounced auction mechanisms with relevant terms and conditions (such as timing and size) made public in advance. Specifically, these have consisted in the sale of US dollar put options to the market through monthly auctions during the periods August 1996–June 2001 and February 2010–November 2011. These instruments give financial institutions the right to sell US dollars to the central bank over the course of the following month, conditional on two requirements. First, the option's strike price is the FIX exchange rate determined by the Bank of Mexico on the business day prior to the exercise. [3] Second, the option can be executed only when the exchange rate of exercise has appreciated with respect to its 20-day moving average.

Of course, the benefits of holding an ample stock of international reserves come at a cost. In order to avoid potential pressures that could weaken monetary policy,

2 The FX Commission, the body responsible of Mexican foreign exchange policy, includes three members of the Ministry of Finance (the Minister and two Deputy Ministers) and three from the Bank of Mexico (the Governor and two Deputy Governors). The Minister of Finance chairs the Commission and has the casting vote. In his or her absence, the Governor of the central bank takes on these roles.

3 The FIX exchange rate is determined by the Bank of Mexico as an average of quotes in the wholesale foreign exchange market for operations payable in 48 hours. The central bank reports the FIX from 12:00PM onward each banking day. It is published in the Official Gazette (Diario Oficial de la Federación) one banking business day after its determination date, and it is used to settle liabilities denominated in US dollars payable in Mexico on the day after its publication in the Official Gazette.

the Bank of Mexico has sterilised the added liquidity injected into the economy, as foreign currency is purchased with domestic currency, by issuing interest-bearing liabilities. The cost of accumulating international reserves arises from the fact that the return on investing international reserves is typically lower than the interest paid on said central bank liabilities.

In view of the above-mentioned trade-off, the FX Commission has at times decided to reduce the pace of accumulation when international reserves have reached levels at which the benefits of future expected accumulation have started to be surpassed by their financial costs (ie the cost of carry). For instance, from May 2003 through July 2008, following a period of rapid reserve accumulation owing mainly to large US dollar sales from Pemex to the central bank, the FX Commission introduced a mechanism through which the Bank of Mexico sold, via preannounced daily auctions over the course of a given quarter, half the net amount accumulated during the previous quarter.[4]

Notwithstanding the merits of holding adequate levels of international reserves, as underscored by the experience of recent years, it is worthwhile to consider additional measures. In Mexico's case, these include an IMF Flexible Credit Line (FCL), which since 2009 has enhanced the economic position of the country in the event of external shocks, at a financial cost lower than that of holding international reserves. Currently at around USD 74 billion, this FCL yields, among other benefits, potential additional resources in foreign currency to face any contingency in the foreign exchange market, an endorsement by the IMF of Mexico's economic policies, and another mechanism of discipline for the authorities.

In addition, Mexico has negotiated several regional arrangements. For instance, under the North American Framework Agreement (NAFA), and with the purpose of promoting orderly currency exchange markets, the Bank of Mexico has a bilateral currency swap line with the US Federal Reserve and a parallel agreement with the US Department of the Treasury. The former, amounting to USD 3 billion, has been renewed annually since it was established in 1994, with Mexico drawing upon the line for the last time in 1995. In the case of the latter, the resources available were tripled in 2018 to USD 9 billion. Further to these, reciprocal currency arrangements (swap lines) for an amount of up to USD 30 billion were temporarily established between the Bank of Mexico and the Federal Reserve at the height of the global financial crisis (from 29 October 2008 to 1 February 2010), to help provide US dollar funding to financial institutions in Mexico.

It is important to note that neither the FCL nor the other arrangements are to be seen as a substitute for international reserves, but rather as a complement to them.

The second issue under consideration in this note relates to intervention in the foreign exchange market.[5] The Mexican economy operates under a flexible exchange rate regime. In this context, market forces determine the equilibrium real rate, the exchange rate plays a key role as a shock absorber, and the value of the currency is

[4] Nearly a year after the introduction of this mechanism, the "previous quarter" reference was changed to a moving average of the previous four quarters to smooth out the seasonality inherent in international reserve accumulation and thus avoid large fluctuations in amounts sold.

[5] For a detailed account of Mexico's experience with FX intervention under the current free-floating exchange rate regime, see R Cano, D Gallardo and J Acosta, "Mexico: free-floating exchange regime", in M Chamon, D Hofman, N Magud and A Werner (eds), *Foreign exchange intervention in inflation targeters in Latin America*, International Monetary Fund, 2019, Chapter 11.

supported mainly by economic fundamentals. At the same time, mechanisms for intervention in the foreign exchange market have been used to manage the level of international reserves, as already described, or to foster orderly market operating conditions.

In line with those related to the management of the level of international reserves, Mexico's FX Commission has relied mainly on preannounced, rules-based tools for interventions to smooth volatility or to provide liquidity to the market. These include the daily US dollar auctions (both with and without a minimum bid price) held on a number of occasions in the past,[6] as well as the previously mentioned USD-denominated credit lines offered to banks (also allocated through auctions), which they could on-lend to corporates.[7] Although the vast majority of Mexico's experience in this regard has taken place in the spot market, interventions through derivatives have also been carried out. In fact, the FX Commission recently introduced auctions of non-deliverable forwards (NDFs) which, by being settled in MXN, protect the stock of international reserves. In place since February 2017, the size of this programme is USD 20 billion, of which only USD 5.5 billion has been auctioned and subsequently rolled over.

Although the FX Commission has typically resorted to rules-based and preannounced operations like the ones described above to intervene in the FX market, extraordinary measures to provide it with liquidity and restore its smooth functioning have also been harnessed, although only in exceptional circumstances. These include the USD auctions of October 2008, as well as four episodes[8] of discretionary outright sales of US dollars, the last of which (in January 2017) was conducted, for the first time, with institutions located outside the country, thereby attesting to the Bank of Mexico's capabilities to intervene at any time, through several mechanisms (including both electronic and more traditional platforms), and not only via domestic counterparties.

Mexico's experience with interventions has been positive, not only as a result of the expertise gained through their execution, but also in terms of their effectiveness in containing surges of volatility in the FX market. On the one hand, when the Bank of Mexico has sought to accumulate international reserves or to reduce the pace of accumulation through purchases or sales of US dollars, respectively, the interventions have served their intended purpose. On the other hand, when the aim of interventions has been to provide liquidity to the market to ensure adequate operating conditions, the evidence suggests that, in most cases, they have reduced extremely high volatility and bid-ask spreads (a proxy for illiquidity). However, caution should be used when arriving at conclusions derived from analyses of the effectiveness of interventions, as this is not a straightforward question. For example, even if volatility does not diminish after an intervention, it is not necessarily the case that the intervention was ineffective.

[6] Auctions *with* a minimum bid price were used during February 1997–June 2001, October 2008–April 2010, November 2011–April 2013, and December 2014–February 2016, while corresponding mechanisms *without* a minimum bid price were in place during March 2009–September 2009 and March 2015–November 2015.

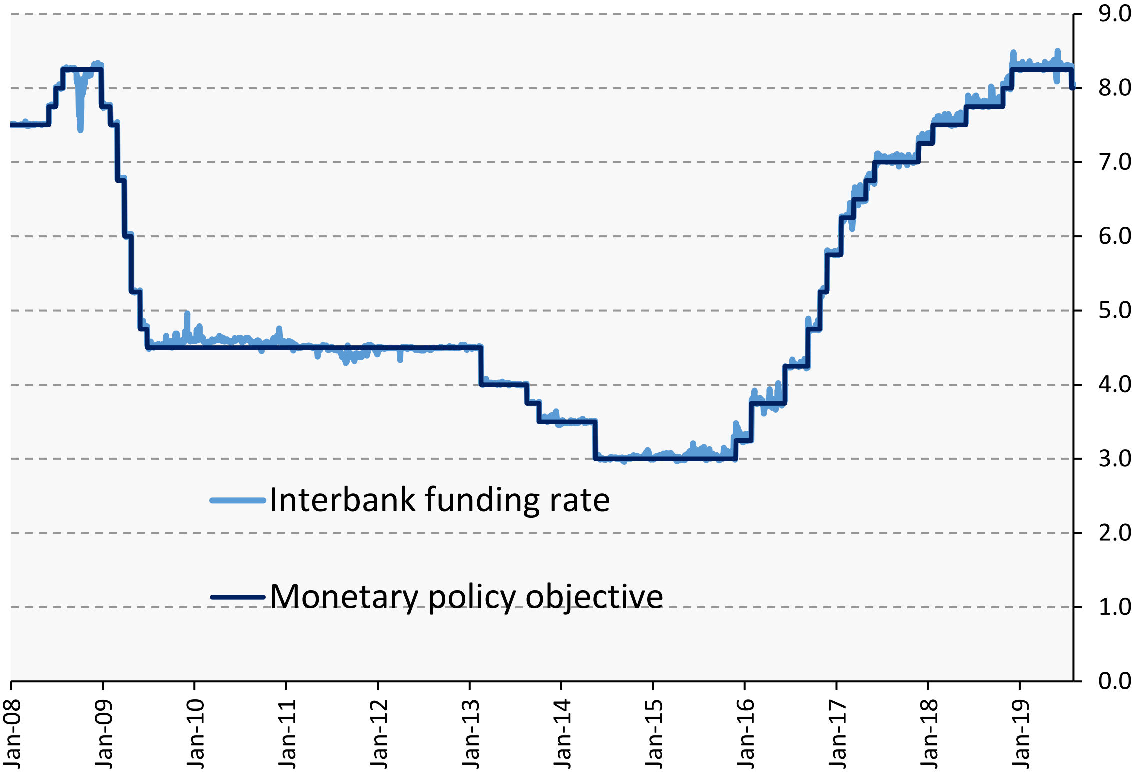
[7] This mechanism was resorted to in April 2009, when USD 3.2 billion were allocated via auction. It is noteworthy that international reserves were not used, as the resources came from the above-noted swap line established with the Federal Reserve.

[8] September 1998, February 2009, February 2016 and January 2017.

The problem is that, in practice, central banks have no counterfactual scenario against which to compare the outcome of a given intervention.

Since the impact of FX interventions on liquidity has been sterilised by the Bank of Mexico, they have had no implications for the implementation of monetary policy. This is evidenced, for instance, by the fact that the interbank funding rate has been very close to the central bank's target since its adoption in 2008 (Graph 1).

Interbank funding rate and monetary policy objective (%) Graph 1



Source: Bank of Mexico.

It is important to stress that the actions described above have been taken *without* setting a target for the exchange rate. As a result, FX interventions have been implemented in a way fully consistent with the free-floating exchange rate regime.

Regarding the Bank of Mexico's standards and practices in reserves management, the Bank has three main objectives: liquidity, capital preservation and return enhancement. The balance among these aims is determined, to a significant extent, by the interplay between the international environment and the Mexican economy, ongoing perspectives on financial markets, and the central bank's needs. Liquidity stands out as the most important of these objectives, and it is taken into account in any context to determine the composition of the reserve's portfolio, while the relative focus on capital preservation vis-à-vis return enhancement – usually conflicting objectives – may change depending on the economic and financial context.

For example, between 2000 and 2012, Mexico's international reserves grew rapidly, from USD 31 billion to USD 164 billion. Naturally, given the amount of accumulated reserves and the low levels of international interest rates, the cost of carry was significant. In this context, the Bank of Mexico focused its strategic asset allocation on enhancing the return of the portfolio to mitigate carry costs. This was achieved by including new asset classes and currencies that allowed the central bank to increase the expected return of the international reserves portfolio without significantly increasing market risk, thereby harvesting the benefits of diversification.

In contrast, starting in 2013, the looming normalisation of the Federal Reserve's monetary policy stance was expected to result in an appreciation of the US dollar and an increase in interest rates, which could pose a significant risk to the returns of the international reserves portfolio, and give rise to capital losses. In addition, the price of gold could drop due to the higher opportunity cost of holding the precious metal, while reserve accumulation had come to a halt given lower oil prices and, as previously described, the need to use the Bank of Mexico's reserves on several occasions to provide liquidity to the FX market and restore its adequate functioning. As a result, the Bank shifted the balance of objectives towards capital preservation, which was achieved by identifying the main risk factors of its portfolio, and adding forward-looking measures to its optimisation models. All in all, the efforts made were successful in mitigating capital losses, and the measures taken allowed the Bank of Mexico to successfully diminish the volatility of returns on the reserves portfolio.

Currently, in view of the uncertainty surrounding the path for US monetary policy going forward and other factors, the focus of the Bank of Mexico's asset allocation strategy is still to preserve capital while maintaining a more balanced portfolio that should be less affected by different economic and financial outcomes.

Within this context, the Bank of Mexico significantly adjusted its strategic asset allocation methodology. Firstly, changes in financial markets dynamics after the global financial crisis made apparent that the usage of historical data had to be revamped. Thus, the models of the central bank were adapted to use the information embedded in market prices as their primary source. This provided a forward-looking element to the methodology, and allowed for a more intuitive and sound estimation of the expected distribution of returns, while minimising subjective elements within the decision-making process. Secondly, the inputs used in the portfolio's optimisation were enhanced by enabling them to match empirical facts, such as the non-normality of asset returns, in view of the evidence suggesting that their actual distributions tend to be "fatter" at the tails than would be predicted under the previously held assumption of a normal distribution. Lastly, the Bank of Mexico redefined the risk metric of the portfolio altogether. From using volatility, and thereby the typical mean-variance approach (Markowitz), towards optimising the portfolio using a risk metric that focuses on the left-hand side of the distribution of returns, such as the conditional value-at-risk, thus explicitly matching the objective function of the portfolio with the objective of capital preservation.

In tandem with these and other practices adopted internally, the Bank of Mexico's framework for reserves management has been further enhanced in recent years through the incorporation of non-benchmarked mandates, awarded to external managers. These provide direct diversification benefits derived from uncorrelated investment strategies which, on the basis of absolute returns but within the boundaries of eligible asset classes, construct portfolios that can be deemed unusual for a central bank. In addition, this type of mandates allow part of the reserve's portfolio to adjust rapidly to changing market conditions, while the external managers' capability to implement investment strategies having a low correlation with other portfolios' positions effectively expands the investment efficiency frontier.

Lastly, our staff's increased exposure to novel approaches and methodologies as part of this process has been of great value, not least due to the resulting learning and insights.

Some important challenges remain. Among these, a most significant one relates to the general public's understanding and perception about the broader contours of the issues at hand, including the rationale behind the FX Commission's directives, as well as their implementation by the Bank of Mexico. Particularly, in spite of the assessed adequacy of the current level of international reserves as per a variety of objective metrics, there is a risk that public opinion could deem them excessive and/or invested sub-optimally from a social standpoint. Should views like these become entrenched, the central bank could face pressures to generate higher returns or distribute the reserves to meet other objectives. In such a situation, a direct and clear communication strategy is important, to better explain the purpose, scope and usage of international reserves, especially their role in the financial and economic stability of the country. In this regard, further to the mandated disclosures derived from Mexico's transparency law, the Bank of Mexico has been working on different projects to provide more clarity to the public, including efforts to increase awareness and understanding of international reserves management practices.