

Financial market development, monetary policy and financial stability in emerging market economies (Mexico)

Bank of Mexico

Abstract

This paper outlines how the aftermath of the 1994 “Tequila” crisis set the course for crucial financial market development (FMD) in Mexico. In order to pursue it, the Bank of Mexico (i) adopted a new nominal anchor, which evolved into the current fully fledged inflation targeting regime; and (ii) promoted the development of the foreign exchange market, with the result that the Mexican peso became one of the most traded emerging market economy currencies. This paper details the efforts towards developing the FX, money and derivatives markets. Also assessed is the crucial role of FMD in improving monetary policy implementation and its transmission, as well as the impact of new financial technologies on monetary policy. Finally, the paper analyses the effect of FMD on financial stability risks and assesses areas where monetary policy transmission and its implementation could be improved.

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Introduction

In Mexico, the starting point for financial market development (FMD) was the “Tequila” crisis of 1994–95. One effect was that the Bank of Mexico depleted its international reserves due to aggressive FX market intervention, forcing it to adopt a flexible exchange rate regime. The monetary authority then faced two challenges. On the one hand, it had to adopt a new nominal anchor instead of the exchange rate, and on the other, prompt action was necessary to develop the foreign exchange market.

The first challenge, the sidelining of the exchange rate as the nominal anchor of the economy, was particularly complex. This variable had been an important anchor for expectations over a number of years. To accomplish the change, in 1995, the central bank limited the growth of net domestic credit to a level consistent with growth in the monetary base, the evolution of the exchange rate and inflation. Additionally, the Bank of Mexico began to announce its inflation forecast and to set its monetary policy in order to keep inflation below that target. Eventually, in 2003, this framework evolved into the current fully fledged inflation targeting regime. The target was set at 3% annual inflation within a range of $\pm 1\%$. These were all major steps towards FMD.

The second challenge facing the Bank of Mexico under the free-floating exchange rate regime was how best to quickly enhance the foreign exchange market’s liquidity and depth. In this regard, the Bank’s legislation to prevent the economy’s dollarisation was helpful in establishing the new regime and advancing market development. For example, bank accounts in foreign currency were made available only to corporations, foreign government offices and citizens living at the border. Other examples include laws on bank capitalisation, freedom of capital flows and efforts towards the development of the derivatives, money and securities markets. Moreover, the risks faced by local banks when taking long positions in US dollars were kept in check by imposing position limits. Currently, those limits are on average $\pm 15\%$ of a bank’s capital. As a result, the Mexican peso has become one of the few fully convertible currencies among the emerging market economies (EMEs) and it is now the second most traded EME currency.

This note details the efforts towards FMD in Mexico from the Mexican financial crisis of 1994–95 until the present. Section 2 describes the main drivers of FMD in terms of FX and money markets, and on bank capitalisation measures. Section 3 reviews the effects of FMD on monetary policy implementation and its transmission and the effectiveness of monetary policy communication. New financial technologies, in the context of FMD, and their potential effect on monetary policy implementation and transmission, are assessed in Section 4. Section 5 looks at the impact of FMD on financial stability risks and Section 6 concludes.

Main drivers of financial market development (FMD)

As mentioned above, the aftermath of the Tequila crisis set the course for the main drivers for FMD in Mexico. Post-crisis, the financial authorities moved to strengthen bank capitalisation and promote the development of derivatives, FX and money markets, as follows:

Bank capitalisation

After the 1994 crisis, many regulatory efforts focused on ensuring that banks were sufficiently capitalised. In fact, Mexico was one of the first countries to adopt the Basel III principles, which include a minimum capitalisation ratio of 10.5% and a Tier 1 capital ratio of 7%, because from 1994 onwards the local regulation already required a minimum capital ratio of 8%. Today, the requirement is even higher, at 10.5%, and is met by all banks in the Mexican banking sector. Additional lessons in terms of capitalisation came with the 2007–09 global financial crisis. As Mexico's banks were well capitalised at the time, the aftermath of the crisis was not as severe as it could have been. Nonetheless, some corporates were less well capitalised, and sustained heavy losses on risky FX derivatives exposures. As a result, corporates are now more prudent in their asset-liability management and risk management policies.

FX markets

There are no capital controls in Mexico. However, since the adoption of the free-floating exchange rate regime in December 1994, macroprudential measures have been instituted to prevent the dollarisation of the economy. The Mexican authorities are confident that there is no need for capital controls or similar measures. The reason is that Mexican authorities believe, on past experience, that an economy with free capital flows has more benefits than costs. However, it may be the case that some costs are imposed by the flexibility of the FX market. For instance, the Mexican peso has proved susceptible to extreme volatility during the global financial crisis and the financial turmoil arising from Covid-19 and the fall in oil prices. This suggests that the peso may sometimes be used as a proxy for other, correlated assets, thus serving as an adjustment instrument for risky investment strategies that have led to disorderly trading of the currency. This contrasts with the approaches of other EMEs, for example, Brazil, Colombia and Peru, which have opted for more protectionist approaches during episodes of stress.

As a result of the regulatory changes described in the introduction, and because of the absence of capital controls, the Mexican foreign exchange market has become one of the most liquid and deep among those of EMEs. According to the September 2019 BIS Triennial Survey (with data as of April 2019), the Mexican peso is the second most traded currency in the EME world, after the renminbi. The peso's daily turnover is USD 114 billion (in both the spot and the derivatives markets), of which the greater part is traded abroad. In fact, only 20% of this volume is traded with at least one Mexican counterparty, making the Mexican peso more of a global currency than a local one.

Exchange rate flexibility has been key to promoting FMD and developing the FX market. As already mentioned, once the exchange rate was fully floated, the FX derivatives market began to develop. Moreover, the absence of capital controls has promoted portfolio and foreign direct investment. Without a floating exchange rate and without capital controls, FMD would have been different and, most likely, slower.

The development of the FX market and its derivatives has come with a price, as reflected in occasional extraordinary volatility. As the Mexican peso is traded 24 hours a day without restrictions, market participants can use the peso as a proxy hedge for positions in other risky assets. For example, when another EME currency cannot be

traded due to a time zone constraint, investors can use the peso instead, to synthetically replicate the desired exposure.

FMD has also been key for the development of the peso as a global currency. As over 80% of the peso's daily turnover is traded outside Mexico, much of the price discovery process also takes place abroad. Yet the soundness of the market is unaffected. This is a liquid and deep market without major distortions under normal conditions, although amplified volatility and significant disruptions are possible during episodes of financial turmoil, as mentioned above.

The effects of FMD on the FX market have allowed the central bank to enhance the effectiveness of its FX interventions, taking into account that most trading of the peso takes place offshore. For example, in its most recent FX spot market intervention in February 2017, the central bank sold US dollars to foreign-based counterparties for the first time in its history. Meanwhile, the evolution of the FX derivatives market allowed the central bank to introduce an FX hedging intervention programme in February 2017, using FX non-deliverable forwards. These allow the Bank of Mexico to intervene in the FX market while maintaining its stock of international reserves.

Money and local securities markets

In 2000, the Ministry of Finance (Secretaría de Hacienda y Crédito Público, SHCP) and the Bank of Mexico implemented measures to develop the Mexican money and securities markets. For its part, the Ministry set up the Market Makers (*Formadores de Mercado*)¹ programme to foster the market for fixed rate government debt securities. The programme increased the participation of eligible institutions in the primary auctions and at the same time expanded the secondary market for government bonds.

Along with the introduction of the Market Makers programme, the federal government was able to increase its local financing relative to its external financing, using fixed rate securities. For example, in 1998, domestic government securities amounted to around 8% of GDP, comprising mainly floating rate notes (55%) and short-term zero-coupon bills (28%). As of October 2019, the total value of domestic government securities outstanding stood at 27% of GDP, of which over 50% are long-term nominal fixed bonds (M-bonos). This has helped the federal government to manage both its refinancing risk and the effect of interest rate movements on its interest expenditure. The changes have also helped to reduce the FX exposure of the government's finances. As of September 2019, 71% of the Federal Government's total debt consisted of securities denominated in local currency, compared with only 15% at the end of 1994.

Other government measures that have contributed to FMD relate to the predictability and transparency of debt securities issuance. To this end, the government has set clear financing objectives and defined auction calendars.²

¹ Market Makers are credit institutions and brokerage houses designated by the Ministry of Finance as participants in the government fixed rate securities market. These institutions must bid at competitive prices in each primary auction, and must also continuously quote buy (bid) and sell (offer) prices in the secondary market to provide liquidity and facilitate investment. This is a voluntary programme.

² According to the Public Debt General Law, the Congress authorises the annual amount of both domestic and external net indebtedness needed to finance the federal government and public sector

Another measure is the syndication of issues, whereby government securities are sold to a pool or syndicate of financial institutions that commit to purchase a certain amount of market-priced securities for a fee. These securities are then onsold to other market participants. Syndication gives the federal government access to a broader base of investors than it would reach through a traditional primary auction.

The development of the government securities market has created a solid and deep interbank funding market based on repurchase transactions instead of unsecured loans. Daily trading volume was MXN 1.24 trillion (6.7% of GDP) in the most recent full year. The liquidity and depth of the repo market have been instrumental for the establishment of a new near risk-free reference rate (the Overnight TIIE, similar to SOFR in the United States).

FMD has also been very important in fostering foreign participation in the domestic financial markets. For example, in April 2010, Citibank announced that Mexico's peso-denominated government bonds would be included in its World Government Bond Index (WGBI). For inclusion in this index, a country must be rated as investment grade by at least two of the major rating agencies. There is no doubt that Mexico's FMD during the 2000s was a deciding factor for WGBI inclusion.

Derivatives markets

In 1995, the Bank of Mexico began to develop the derivatives market to provide market participants with additional exchange rate hedging methods. The first steps were to allow local banks to trade FX derivatives and to set rules to facilitate the trading of MXN futures contracts on the Chicago Mercantile Exchange (CME). Eventually, an over-the-counter market was developed too. Moreover, in May 2008, the Mexican peso was included in the Continuous Linked Settlement system, a global multicurrency settlement system that aims to eliminate FX settlement risk due to time zone differences. As a result, the Mexican peso can now be traded round the clock.

The development of the derivatives market has been of crucial importance in reinforcing Mexico's financial stability. Thanks to the development of the FX derivatives markets, it is now possible to hedge FX exposures. Market participants can also hedge interest rate risk via the interest rate swap (IRS) market. In fact, the IRS market is even deeper and more liquid than the long-term fixed rate local currency bond market. Thus, market participants can easily find a way to hedge their risks.

There is also a futures market linked to the main benchmark rate, the 28-day TIIE (the interbank equilibrium interest rate, Mexican IBOR) – most variable-rate credits are referenced to this rate. The futures market linked to this benchmark expanded strongly prior to the global financial crisis, and has developed stably since then.

FMD and global spillovers to EME financial markets

After the inclusion of Mexican government bonds in the WGBI, other global indexes began to add Mexican local bonds. As a result, foreign investors started to buy a

institutions, as included in both the country's Income Law and Expenditures Budget. Additionally, during the months of March, June, September and December, the Quarterly Program of Government Securities Auctions is announced for instruments to be placed in the local financial market, which must be consistent with the general criteria approved by the Congress for this fiscal year in the context of sound fiscal policy.

significant share of local Mexican bonds. Foreign holdings of Mexican government local currency fixed rate bonds with maturities of less than one year went from MXN 0.3 trillion in January 2010 (market share of 24%) to MXN 1.8 trillion in November 2019 (market share of 55%). Of course, this increase was also due to the interest rate differential between the Mexican peso and the major currencies after 2010.

The high share of foreign participants in local bonds can be seen as a risk for financial stability. If, for example, the Mexican government were to lose its investment grade, a massive liquidation of these positions could occur, jeopardising financial stability. So far, these holdings have proved to be resilient to risk events, but this might not always be the case. For instance, in 2016, despite the uncertainty surrounding the outcome of the US elections, there was a significant increase in foreign holdings of local bonds. This reflected the sharp increase in peso interest rates, which incentivised investors to add to their peso-denominated positions in the context of very low yields abroad, or adjust their positions by buying Mexican bonds to keep their share constant.

FMD and monetary policy

FMD has been crucial to improving the implementation of monetary policy via market operations such as repo operations or securities auctions, in the place of non-market operations such as compulsory deposits or reserve requirements.

Effects of FMD on monetary policy implementation and its transmission

Prior to December 1994, the crawling peg-exchange rate regime reduced the scope for improving monetary policy effectiveness. However, the regime changed after the central bank was forced to fully float the exchange rate after running out of international reserves during the Mexican financial crisis. Due to volatility in the FX and money markets in the aftermath of the crisis, it was not possible to set an interest rate target. Therefore the growth of monetary aggregates was set as the operational target of the central bank.

From 1995 to 2003, the operational target was the average balance of commercial banks' current accounts at the central bank over a 28-day period (the "corto"). Targeting current account balances avoided the need to set a specific level for short-term interest rates. Furthermore, in an environment of falling inflation, the "corto" objective allowed interest rates to fall in line with changing inflation expectations (between 1995 and 2003, inflation fell from 52% to 4%). From 2003 through January 2008, the operational target changed to a daily target of the balance of commercial banks' current accounts, and an inflation targeting regime was adopted at the start of that period. Finally, in 2008, when the central bank had gained more credibility and market volatility was low, the operational target was changed to the overnight interbank funding rate.

FMD has also influenced the choice of instruments used to sterilise excess liquidity in the money markets. The excess was historically explained by the accumulation of international reserves. After the Mexican financial crisis, the central bank implemented a programme to replenish its international reserves. As Mexico's

oil production ran at up to 3.4 million barrels per day during the early 2000s, Mexico received ample inflows from the oil sector at that time, given that Pemex, the state oil company, can sell its foreign currency revenues only to the central bank. As a result, from 1996 to 2015, the Bank of Mexico accumulated a significant amount of international reserves that had to be sterilised.

During the 1990s and the early 2000s, this sterilisation was done through compulsory deposits imposed on local banks. This was not well received by the market since the withdrawal of liquidity was not market-determined. By the second half of the 2000s, once money markets in Mexico were more developed, it was possible to sterilise excess liquidity by auctioning government securities.

The aim of sterilising excess liquidity is to ensure that on a daily basis local banks have to attend the open market operations of the central bank (OMO) in order to receive credit. In this regard, FMD has been crucial to facilitating OMO as a way of providing liquidity to local banks. With the development of the market for government securities, it is easier to provide short-term liquidity through repo operations collateralised with government securities.

FMD has also been fundamental to enhancing the transmission of monetary policy. Before the first issuance of a fixed rate bond at the beginning of 2000, it was impossible to conduct analysis based on market prices but, today, thanks to the depth and liquidity of the money market, it is possible to extract from the yield curve implicit monetary policy expectations and inflation premiums, among other information. Moreover, as mortgages and corporate loans are now linked to long-term fixed rate government bonds, it is easier to influence aggregate demand through changes in the monetary policy stance.

Additionally, the development of a market linked to a benchmark rate was also important in enhancing monetary policy transmission. As already mentioned, the main benchmark rate in Mexico is the 28-day TIIE. Because most variable rate credits are referenced to this rate,³ and because the rate reacts promptly to any change in the monetary policy stance, the transmission of monetary policy is enhanced. Before 2000, because the market tied to the TIIE was shallow, the transmission of monetary policy was weaker.

It is important to mention that the interest rate channel is still thought to be less important than the other channels, such as those of expectations and the exchange rate. In fact, the effects on aggregate demand from the interest rate channel are weaker in Mexico than in other economies. This result may reflect the low level of financial inclusion and the size of Mexico's informal sector.⁴ On the other hand, given its openness, the Mexican economy is highly exposed to external shocks, which may explain the greater relative importance of the exchange rate channel. In addition, progress in the control of inflation and the greater credibility of the central bank may explain the growing importance of the expectations channel. In this context, even though the transmission of monetary policy has improved substantially due to FMD, there is scope for further development.

³ Approximately 80% of bank loans to firms are variable rate in Mexico. Moreover, most interest rate swaps (IRS) are linked to the TIIE, representing 70.7% of the total IRS market at end-August 2019. The notional amount of those contracts was USD 829 billion, or roughly 70% of GDP.

⁴ According to BIS data, in 2018 Mexico's bank credit-to-GDP ratio was 19.5%, while in Brazil, Chile and Colombia it was 59.5%, 82.3% and 45.3%, respectively.

Foreign monetary policy spillovers to the local economy

Mexico's financial integration into the global economy has been positive for the domestic economy. In particular, it has made possible to complement domestic savings with external resources and it has helped to make domestic financial markets deeper and more liquid. Since Mexico is a small open economy, domestic financial markets and inflation are naturally affected by external factors. That is why the central bank, when assessing the appropriate monetary policy stance, takes into account the international situation, and how it might affect the Mexican economy and, particularly, its inflation dynamics.

For instance, given the high degree of economic integration between Mexico and the United States, Mexico's business cycle depends heavily on the evolution of the US economy. As such, US monetary policy is an important factor among the many elements that influence monetary policy decisions. Nevertheless, this does not mean that the Bank of Mexico mechanically adjusts the reference rate in response to changes in the US federal fund rate; this is simply one factor, among many others that are monitored.

Going deeper into the issue of monetary policy independence in small open economies, such as the Mexican one, some scholars have argued that in the absence of capital controls, international financial integration significantly reduces monetary policy independence.⁵ However, empirical studies conclude that countries that do not peg their exchange rates enjoy significant scope for adjusting their short-term interest rates independently of foreign ones. As changes in short-term rates seem to reflect changes in domestic macroeconomic variables such as inflation and output, such countries exercise substantial monetary independence over short-term interest rates.⁶

However, long-term interest rates are highly correlated across countries, suggesting that the connection between long-term rates and domestic macroeconomic variables is weaker. Thus, independence for long-term interest rates seems to be weaker. But these results may vary between countries. For example, in the case of Mexico, long-term interest rates have been influenced by global factors, such as US long-term interest rates. Yet, some components of these rates may also have been influenced by domestic factors. First, sound macroeconomic policies may have had a positive impact on the sovereign risk premium. Second, the decline in inflation may have helped to reduce the inflation risk premium.

Effectiveness of monetary policy communication

The Bank of Mexico's communication policy has evolved in line with domestic FMD. After the domestic financial markets and inflation stabilised, it became less desirable to send monetary policy signals through the above-mentioned "corto". Accordingly, in 2008, the Bank of Mexico switched its operational target to the Fondo rate (the

⁵ See H Rey, "Dilemma not trilemma: the global financial cycle and monetary policy independence", in *Global dimensions of unconventional monetary policy*, proceedings of the Federal Reserve Bank of Kansas City Jackson Hole symposium, August 2013.

⁶ See M Obstfeld, "Trilemmas and trade-off: living with financial globalisation", *BIS Working Papers*, no 480, 2014.

overnight interbank rate) and changed its communication accordingly. For instance, the Bank of Mexico has published quarterly inflation reports since 2000.

In regard to monetary policy decision-making, the number of monetary policy meetings per year fell from 14 in 2003 to eight starting in 2011. Since market development required more transparency, the Bank of Mexico added its monetary policy minutes to its communication toolkit starting in 2011. Finally, in 2018 the central bank strengthened its communication policy through four measures: (a) monetary policy releases that now indicate if there were any dissenting voters without revealing their names (although the minutes now include the identity of dissenting voters and the arguments behind their votes); (b) from May 2021, transcripts of central bank board meetings will become available to the public three years after the corresponding meetings; (c) monetary policy releases and minutes are now available both in Spanish and English; and (d) board members' speeches and public presentations are now available to the public.

In addition, the central bank has added to its communication toolkit: (a) **meetings with local market participants** to brief them on its liquidity facilities; (b) **monetary policy instrumentation educational seminars and conferences** for universities and academic researchers; and (c) a **market operations-related publication**.

New financial technologies and their impacts on monetary policy implementation and transmission

Central banks are aware that technological advances, along with declining cash usage and the rising use of electronic payments, have paved the way for the development of new financial assets. In particular, the advent of digital currencies calls for a comprehensive evaluation of their effects over monetary policy implementation and transmission, as well as their impact on financial stability.

Implementation of monetary policy: The creation of digital assets by big tech companies has not yet affected the implementation of monetary policy so far, but it could have unforeseen effects in future. Typically, central banks implement monetary policy by setting a "target" or a "desired level" for excess reserves that is compatible with the policy rate target (excess reserves are the stock of deposits of commercial banks at the central bank that exceed the deposits that arise from the reserve requirement). In the case of Mexico, that target is set at zero, so that at the end of each day, bank deposits in the central bank must be zero on aggregate. In this context, the challenge for the central bank will be to accurately forecast the demand for bills and coins under any new scheme of digital currencies, but the basic principles of the framework should remain the same.

However, if there is a generalised adoption of these assets in place of traditional bank accounts, there could be a high risk of financial disintermediation, as commercial banking deposits might shift into these new assets. In this scenario, the monetary policy transmission channels could be affected by the weakening of the banking deposits channel. At this point, if the digital assets were to pay an interest rate determined by another jurisdiction or in the case of an FX gain (if the digital currency were denominated in a foreign currency), the elasticity of commercial banking deposits in terms of interest rate movements would fall.

On the other hand, if the central bank were to issue a digital currency itself, the effects on monetary policy implementation would depend on the details of the framework. For example, if the central bank were to open digital currency accounts for all individuals in the economy, significant changes to the monetary policy framework might be required. In this case, the balance of personal deposits at the central bank (amount of reserves) would be more difficult to forecast and, therefore, monetary policy might become more difficult to implement.

Transmission of monetary policy: New financial technologies can also provide new tools for conducting and transmitting monetary policy. Remunerated central bank digital currencies (CBDCs) could help central banks to overcome the so-called zero lower bound. Negative interest rate policies do not directly affect the physical cash market and therefore place a restriction on the central bank's scope for stimulating the economy. Thus, interest-bearing CBDCs could serve as a monetary policy tool, by allowing central banks to directly alter the cost of money in the cash market by affecting the credit channel of monetary policy implementation.

Financial stability risks: At first sight, as long as the digital assets issued by big techs are fully backed up by real money or by actual deposits of money in a commercial bank, financial stability should not be jeopardised. However, the large number of users these companies have might imply competition and concentration issues. For example, Facebook has over 80 million active users in Mexico. As such, the company has the potential to become the institution with the largest number of financial services users, making it "too big to fail" but falling outside the appropriate prudential regulation.

Moreover, a greater share of fintech credit could reduce bank profitability, which could lead to a weakening of their lending standards and eventually jeopardise financial stability. Finally, if fintech credit intermediation continues to expand, this could create new transmission channels where risks generated in fintech lending industry could spread to the entire financial system.

Impact of alternative investment instruments on financial stability risks

Over the past decade, FMD has not led to increased risks stemming from the issuance of complex structured products or investment instruments in Mexico. The domestic market for securitisations is still small, has not shown abrupt growth, and has adhered to simple structures with strong credit enhancement. The main securitisation issuers are the two institutional housing funds (Infonavit and Fovissste), which follow a very conservative approach. Moreover, non-bank credit intermediaries are still relatively small, although growing at moderate rates.⁷ Their assets (excluding central bank

⁷ The FSB has established a high-level policy framework that includes a monitoring methodology for member jurisdictions to apply in a consistent manner for the purpose of measuring the shadow banking sector or, under the current terminology, non-bank financial intermediaries (NBFIs). Under the FSB methodology, a narrow measure captures the NBFIs that are deemed to be involved in potential systemic risk-related activities. This aggregate measure, which is the sum of five economic functions or categories of activities, registered a 5% annual growth rate as of end-2018. However, some sectors, such as broker-dealers, registered an annual growth rate of 21% during the same

assets) account for about 16.2% of total financial system assets, as of June 2019.⁸ During the global financial crisis, some non-bank financial institutions dependent on short-term market funding (so-called Sofoles, which are the predecessors to Sofomes),⁹ especially those investing in illiquid long-term loans (mortgages), faced significant stress in rolling over their market-based funding. In response, the financial authorities have set out a regulatory path that led to the disappearance of Sofoles. These were replaced by other non-regulated entities such as the Sofomes, which offer a broader span of financial services and credit segments. Subsequent regulation was amended to reflect that potential vulnerabilities could arise in market-based funding-dependent entities with high liquidity and maturity transformation. These entities remain under the surveillance of authorities and the regulatory perimeter is periodically reviewed.¹⁰

Other market-based investment vehicles specialising in certain business sectors have grown in size in the last 10 years without posing material risks to financial stability. These include alternative financing sources or entities that fund themselves through the issuance of various structured products recognised in the securities regulations. These alternative financing sources may take the form of, for instance, *fibras inmobiliarias*, which are equivalent to real estate investment trusts (REITs). Others are similar to private equity trusts, financing infrastructure or commercial ventures that issue participation certificates (trust units similar to shares).¹¹ These have increased the menu of investment products available mainly to institutional investors (particularly those invested in Capital Infrastructure Certificates), improving their long-horizon investment strategies, but in some cases have also proven attractive to foreign investors.

period, while collective investment vehicles (the largest economic function) grew at an annual rate of 2%. For comparison purposes, total financial assets (including central bank assets) grew at a rate of 6%.

⁸ Mostly, this corresponds to regulated and supervised entities participating in credit intermediation activities, which are included under the FSB's narrow measure of shadow banking (eg investment funds, broker-dealers, microfinance companies, credit unions, cooperatives, non-bank banks known as Sofomes etc). Sofomes are non-bank financial intermediaries that take on lending, leasing and/or factoring activities but which are not allowed to take deposits from the public. They fund via loans, equity and/or public debt issuance. When they have public debt outstanding, Sofomes are regulated by the National Banking and Securities Commission (CNBV). In addition, Sofomes with equity links to banks are regulated as banks to avoid regulatory arbitrage. However, regulation also applies on a solo basis.

⁹ When Mexico joined NAFTA, Sofoles were introduced as a type of entity similar to finance companies in the United States and Canada. The aim was to harmonise the financial systems of the three countries. At the outset, Sofoles specialised in particular credit segments, whereas the Sofomes that replaced them were active in a broader range of financial services and credit segments. Sofoles were abolished in 2013 as legal entities, as were factoring and leasing companies, so that Sofomes took over the whole gamut of services and products offered by non-bank finance companies in Mexico.

¹⁰ Mexico's Financial Stability Council periodically assesses the regulatory perimeter for NBFIs.

¹¹ These include Capital Infrastructure Certificates (CCDs or CKDs), *Fibras E*, Investment Project Certificates (Cerpis). The aims of these investments differ somewhat. CCDs and Cerpis are similar to private equity investment structures and are managed by professional managers. Cerpis are a new form of structured vehicle. In contrast to CCDs, Cerpis investors are not involved in investment decision-making.

Final remarks

Mexico has made significant progress in terms of FMD since the Tequila crisis. The liberalisation of the exchange rate, the elimination of capital controls, the development of the FX market and the derivatives market, and the adoption of macroprudential measures were essential in promoting a sound FMD. The benefits have included the adoption of an inflation targeting regime, the development of a deeper government securities market and a highly liquid FX market that facilitates inward investment.

At the same time, the Mexican authorities are aware of the risks that FMD may bring, and have responded with measures to increase bank capitalisation and promote the development of derivatives, FX and money markets. The development of the FX market and its derivatives has come at a price, which is reflected in some occasional additional volatility. Furthermore, there are still areas where monetary policy transmission and implementation could be improved. The same is true for financial inclusion. Efforts have been made by the government and by the central bank to encourage digital payments via a platform developed by the Bank of Mexico (CoDi). This platform is free for all users and is designed to pay and receive payments instantly through QR codes. To use CoDi, the user must have a bank account. Thus, the platform is expected to increase the number of account holders around the country. Additionally, financial authorities must continue to develop transactions-based reference rates in order to move away from the *libor* rates with their well known failings. In this respect, Mexico is following the global trend and is on track to launch a new reference rate based on overnight repo transactions.