QE Exit and the Emerging Market Challenge

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Although all crises share common traits, each is very particular in its own way. At times the resolution of a crisis can create a new set of problems for which the original response is ill-fitted. In rare cases, these problems become as substantial as the original catastrophe and overlap with the recovery. In these circumstances, there is no rulebook to guide policy. The challenge then is to adequately prepare for the ensuing disruption. Such is the case of the current global conundrum. The unprecedented monetary stimulus, which flooded the global economy after the great financial crisis, now risks destabilizing the world economy and the international financial system if the appropriate policy measures are not taken to limit the potential costs of collateral effects from unconventional policies.

The massive policy response to the global financial crisis was necessary in order to keep financial markets running and avoid greater harm to the real economy. However, it has brought with it unintended consequences as the recovery consistently has failed to meet projections and diminishing returns to policy measures have forced officials to stretch their tools beyond all previous expectations, potentially creating an ever-growing array of dangerous equilibriums, which threaten to cause a renewed bout of elevated volatility. The challenge going forward will be to achieve a solid foundation for sustained growth amid an international climate dominated by short-term interests.

Liquidity Fueled Rallies

Since the crisis erupted in 2008, several measures have been taken to provide support for the real economy and recover an efficient functioning of financial markets, all in the context of the current global regulatory overhaul. Results have varied depending on circumstances and instruments. In the U.S., asset purchases and recapitalizations were quite effective in getting banks back on their feet, but repairing household balance sheets has been more subdued.[1] In the U.K., bank deleveraging remains substantial and is still taking its toll on productivity. The euro area has combined these features while it struggles to resolve deep structural imbalances, which stand in the way of a sustainable currency union. Everywhere, fiscal space has been exhausted and consolidation is now underway. Japan stands somewhat apart as it seeks to instrument a policy regime shift and induce a reflation of its economy.[2]

The need to provide additional monetary stimulus, beyond zero short-term rates, has bred a plethora of unconventional policies in advanced economies (in most cases, demanding a substantial expansion of the central bank's balance sheet). The combined assets of the central banks of the G-4 countries now stand at $10 trillion and are expected to add an additional $2 trillion by the end of 2014.[3] At present, central bank assets represent 22.6 percent of GDP for the U.S., 26.7 percent for the U.K., 27.4 percent in the euro area, and 31.5 percent in Japan.[4] Naturally, this scope of policy accommodation by the world's large central banks has had significant global effects.

Emerging markets, on the other hand, have managed to pull through the crisis in strong footing. Solid macroeconomic fundamentals, a robust policy response, and adequate preemptive supervision limited the economic costs imposed by the global crisis and set the stage for a resilient post-crisis performance. This global economic diver-

gence stands at odds with past global recessions.[5] In per capita terms, the average economic recovery for advanced economies is an average growth of 2.7 percent per annum in the four years following the crisis, while it has been only 1 percent since 2008. In contrast, emerging markets have achieved an average annual per capita growth rate of 5.3 percent this time round, rather than the historical average of 2.9 percent.

Extremely easy global monetary conditions coupled with a strong economic performance in developing economies fueled a large flow of capital from advanced economies to emerging markets.[6] Capital flows, since the global recovery began in 2010, have remained at historically elevated levels. Since 2010, private capital flows to emerging markets have averaged $1.1 trillion, a figure surpassed only by the level observed in 2007, which was incidentally a pre-crisis outlier.[7]

Capital flows to emerging markets can be highly beneficial when they are supportive of investment and economic growth. But there are also a number of risks associated with such flows which should be closely monitored. Market failures or inadequate regulation could lead to unsustainable increases in the price of assets, an overly generous provision of credit and lax standards, and excessive currency appreciation with negative effects on real activity. Additionally, if improperly managed, they can lead to a deterioration of a country's external balance and increase its vulnerability to an abrupt reversal.[8] Indeed, several experiences of balance of payments crises in the 1990s illustrate the large costs external shocks can impose on a vulnerable economy.

However, until recently, many policymakers around the globe have carried on under the assumption that when the time ultimately comes to reduce monetary stimulus, the exit would be gradual and orderly. Thus, policy was kept easy in much of the emerging world and externally-financed debt allowed to flourish. Some governments attempted to support domestic growth through expansive monetary and fiscal policies, exacerbating the buildup of domestic imbalances and increasing vulnerability to a rapid decline in global liquidity.

The result has been a strong rally in emerging market assets which responded more to investors' global search for yield than capital receptor countries' underlying growth perspectives. This trend has been quite broad, depressing risk premiums on emerging market assets significantly. For instance, the post-crisis EMBI+ index average has been 200 basis points below the average level observed throughout 2000-2007. Naturally, this mispricing of risk (not unlike the pre-crisis spread compression observed in the euro area) created a boom in both corporate and sovereign debt throughout the emerging world; public sector issuance increased by 50 percent since 2008 and dollar-denominated corporate debt by 350 percent.[9]

In the case of Mexico, the influx has been dramatic. Net private capital inflows since 2010 have averaged over $60 billion, skewed primarily toward government debt and equity investment. Foreign holdings of government debt have increased by a factor of 10 since mid-2007. The result is that now, foreign investors hold around 37 percent of total public debt in Mexico,[10] up from 9 percent in 2007. This trend has pushed rates down to historical lows; with the two-year and ten-year notes registering 3.8 percent and 4.4 percent, respectively in May 2013. This is a substantial drop from their 2001-2007 average levels of 8.5 percent and 9.1 percent, respectively.

Similar cases include Turkey, where foreign holdings have increased from 11 percent in 2008 to 30 percent now, and South Africa with an increase of 25 percent to 38 percent.[11] In general, the broad flow of capital to emerging markets greatly relaxed the external financing environment they faced. This supported robust domestic credit growth and asset inflation in some regions. Where external balances have deteriorated, it has significantly increased vulnerability to a sudden stop in capital inflows. This is a scenario which now seems to be playing out.

Bursting of a Global Bubble

When the Fed set out in May its preferred timeline for closing QE3, it drastically shifted perceptions regarding the committee's balance of risks for the U.S. economy, its level of conviction in the recovery, and its hawkish bent. Since then, volatility in global financial markets has increased significantly, but disproportionate pressure continues to fall on emerging market assets. The market reaction registered after the Fed's announcement demonstrates the potential external shocks emerging markets will face as the economic recovery in the developed world gathers momentum.

Within a month from the Fed's communiqué on May 22, as investors scrambled to unwind highly leveraged positions, emerging market equity and bond funds registered a combined net outflow of $25 billion.[12] The selloff in emerging market assets was broad as the yield on the U.S. Treasury note climbed 60 basis points: government bonds fell 5.3 percent, corporate bonds declined 7.2 percent, currencies depreciated 5.1 percent and equities fell 13.9 percent.[13] As the mirage of a smooth and gradual exit from QE dissolves, investors will continuously tend to frontload the implications of Fed tightening.

In the case of Mexico, the selloff was just as intense but somewhat less broad-based. The currency depreciated 7.9 percent, but was mainly technical as investors closed long positions. Equities fell 6.2 percent and dollar-denominated corporate bonds lost a similar 6.7 percent.[14] But, while longer duration government debt sold off and 10-year government bond yields increased 133 basis points, foreign holding of short-term government debt increased by around 5.5 percent. This relative stability in public sector debt was most likely due to the country's strong external position, as will be further elaborated below.

In general, it is clear that the monetary forces which inflated the emerging market asset bubble are now retrenching and the rise in advanced economies' risk-free rates now represents a broad shift in trend, rather than short-term volatility. This is being accompanied by increasing risk premiums for emerging market assets; credit default swap spreads have widened over 100 basis points from early May to the end of June.[15] In this context, the most pressing questions for policymakers are how far will risk premiums rise before they stabilize and how can they smooth the adjustment.

What Can Emerging Markets Do?

These considerations have led many to refer to the 1994 bond selloff and capital reversals experience, which caused severe crises in many emerging market economies, as a precedent of what may come. However, emerging markets have come a long way in the past two decades. The fact that no emerging market economy experienced a severe financial dislocation as a result of the great financial crisis bears witness to this. Future episodes of capital reversals are more likely to follow the pattern set out by the 2008 financial shock than the 1994 episode.[16]

In 2008, the debt profile of emerging market economies was quite solid and several countries had embraced orthodox macroeconomic management frameworks. The net debtor international investment position of emerging markets and external accounts were markedly better than a decade prior and central banks had dramatically increased their holdings of international reserves. In general, private and public balance sheets were much stronger than before and financial markets had developed with prudent regulatory regimes.[17]

These factors contributed to the resilience exhibited in the past half-decade. However, gains notwithstanding, the 2008 financial shock caused a great deal of stress all throughout the developing world. The ensuing policy response played as important a role in navigating the great financial crisis as did stronger fundamentals. So, it is useful to assess the measures implemented during 2008-2009 in the context of the sudden stop in capital flows which many emerging markets experienced. While a full assessment of the policy response of emerging markets to the great financial crisis is far

beyond the scope of this paper, the Mexican experience offers valuable insights on the matter.[18]

Following the collapse of Lehman Brothers, financial disruptions quickly came to Mexico in the form of tighter external financing conditions and selloffs of long-term securities. International commercial banks reduced extensions of new credit and did not rollover existing ones. Investors significantly reduced their financing, causing a net portfolio investment outflow of 2.5 percent of GDP in the fourth quarter of 2008 and a fall of 1.4 percent of GDP in foreign direct investment. Additionally, demand for corporate and government bonds became extremely scarce.[19] This evaporated liquidity in the foreign exchange market and caused the currency to depreciate around 23 percent within one month following the Lehman collapse. The stress experienced in financial markets can be gauged through the increase in government bond yields experienced during the crisis: 10-year yields, which averaged 7.9 percent in the first part of the year, spiked to 11 percent in October 2008; similarly, 30-year yields jumped from an average of 8 percent to 11.3 percent per year.

These circumstances were exacerbated by the collapse in external demand and the deterioration of the country's terms of trade which followed the financial shock. The result was an economic contraction at the end of 2008, which interacted with the greater risk aversion to further depress economic activity.[20] All this led to a fall in annual real GDP of 6 percent in 2009. Policy intervention was necessitated on many fronts to avoid more severe domestic financial sector disruptions and facilitate economic adjustment to the new environment.

To provide liquidity to the foreign exchange market and restore its proper functioning, an absence of which threatened to preclude corporations from meeting their U.S. dollar obligations, the central bank implemented two types of dollar auctions starting in October 2008. On the one hand, extraordinary auctions were held to sell dollars directly to the market, providing a total amount of over $12 billion. On the other hand, in order to limit the level of exchange rate volatility, while maintaining a free floating regime, daily auctions were held to sell dollars at a minimum price of a 2 percent depreciation on the previous working day's exchange rate.[21] Thus, volatility was limited in the foreign exchange market while market forces continued to determine the price of the currency.

To restore confidence that financial and economic disruptions would not overwhelm the government, and that the country had the means to meet its obligations, three important measures were taken. Firstly, the federal government's exposure to oil revenue was reduced through the purchase of put options on the price of the country's export mix, effectively hedging about 70 percent of gross exports of oil.[22] Secondly, additional financial buffers, besides the central bank's international reserves, were obtained through access to the International Monetary Fund (IMF)'s flexible credit line (FCL) to the amount of $47 billion, and a currency swap line was established with the Fed.[23] Finally, the Mexican Ministry of Finance published a thorough analysis of the country's balance of payments for 2009, detailing the scope available to accommodate expected increases in the current account deficit. Together, these measures served to reassure markets that the government would facilitate the economy's economic adjustment and support the functioning of financial markets through adequate provision of liquidity without undermining fiscal soundness.

Measures in financial markets were also implemented to normalize the functioning of money and credit markets. The central bank introduced a new liquidity facility for commercial banks at a reduced cost, relaxed collateral requirements to improve liquidity in the interbank market and implemented interest rate swap auctions to help the market better manage interest rate risk. The Ministry of Finance also provided support in the form of a program of government guarantees to corporate credit to reduce the risk premium on firm loans and several debt management measures were taken to facilitate a shortening of investors' portfolio duration. Thus, prices were allowed to adjust in an

orderly manner. Local financial markets, enabled by adequate capitalization and quality assets, were able to play a stabilizing role in the crisis. Commercial banks and institutional investors replaced to some extent government funding as external players withdrew from the market.

In general, the Mexican economy was able to adjust to the external shocks because adequate liquidity was provided to financial markets, excessive volatility was curbed in the context of market-friendly interventions, confidence was restored through an effective communication strategy, and sizable and credible financial backstops. At the same time, solid fundamentals allowed macroeconomic policy to attenuate aggregate fluctuations through countercyclical monetary and fiscal policies which provided support to aggregate demand. Since the crisis, the economy has experienced robust growth, a strong recovery in domestic credit, and steep inflows of private capital.[24]

The Mexican case was not unlike that of many other emerging markets during the crisis. One may therefore surmise a few points which could prove helpful going forward. The first is that fundamentals matter. Emerging markets' capacity to withstand large external shocks was due in large part to the significant advances in macroeconomic fundamentals achieved prior to the crisis. Today, however, a number of countries look more vulnerable as activity has become dependent on external financing and governments sought to support growth through expansive policies, exacerbating the build-up of external imbalances in some cases. Pockets of currency and maturity mismatches, large current account deficits, and high external debt stocks have emerged. In these cases, the set of policy options available is more restricted and it will be more difficult to limit the damage to the real economy induced by the tightening of financial conditions.

Thus, countries should rebuild policy buffers that have been exhausted and strengthen their fundamentals to reduce vulnerabilities. Especially vulnerable are commodity exporters that are likely to face a long-term decline in their terms of trade. Additionally, a greater development of emerging markets' financial systems is essential in order to increase stability in the international financial system. As foreign investors may withdraw from government financing, the capacity of local private investors to fill the gap could prove pivotal in avoiding greater economic costs.

As mentioned earlier, strong balance sheets need to be fostered by emerging markets to limit potential costs of tightening external financing conditions. In the case of Mexico, this has played a key role in the country's relative stability. Although the inflow of capital has been significant in recent years, this has not translated into a large current account deficit; with an average of 0.6 percent of GDP since 2010. Nor have resources served to unsustainably expand financial intermediaries' balance sheets; rather, foreign investment has allowed residents to invest abroad at a historical level of 2.2 percent of GDP in 2012 (up from around 0.5 percent between 2000-2008)[25] and accumulate foreign reserves (now around 15 percent of GDP) which serve to self-insure against negative external shocks.

Additionally, the government has extended the average duration of its debt from six years in 2008 to eight years at the end of 2012 while maintaining a moderate level of foreign-currency denominated debt, around 5 percent of GDP. Strong supervision of the banking sector has avoided currency mismatches and maintained robust levels of capitalization.[26] And finally, the government has actively sought to widen and diversify its investor base, with a particularly important promotion of pension funds as institutional investors (now holding around 17 percent of government debt).[27]

This contrasts with the cases of South Africa and Turkey, cited above, who at present register some of the largest current account deficits among emerging markets at 6.5 percent and 6 percent of GDP, respectively. Additionally, over 90 percent of Turkey's external debt is foreign currency-denominated, and short-term debt stands close to 100 percent of reserves. Both countries' external debt has a large component of volatile bank and

corporate lending, representing 42 percent in South Africa and 70 percent in Turkey. In circumstances such as these, it is important that countries take action to strengthen their balance sheets to avoid potential disruptions ahead.

The second point which must be emphasized is that policy matters. A strong policy response in the event of an abrupt reversal of foreign capital is important not only in avoiding financial dislocations, but also for restoring investor confidence in the economy. An adequate provision of liquidity is essential in mitigating undue damage to the real economy. But it should be done while respecting market forces. In this respect, international reserves are an important element in policymakers' toolbox and should be determined in terms of the risks inherent in the international financial environment. Also, the benefits associated to floating exchange rates (an aspect of Mexico's policy framework which has been essential in smoothing economic adjustment costs) should not be overlooked.

As external financial conditions tighten, policymakers need to support an adequate pricing of financing instruments. So, it is important that governments maintain credibility in their financial markets during episodes of exogenous stress through a strict adherence to a rules-based policy framework. However, not all tightening is the same. Much depends on the gyrations observed in yield curves rather than on level variations on any particular term. In episodes of uncertainty, investors may switch to a generalized *risk-off* mode, selling their holdings of risky assets to the degree which market liquidity will allow, or they may take a more sequenced approach, initially rebalancing toward shorter-duration and more liquid assets. In these instances, governments have a greater role to play, as seen in the Mexican 2008-2009 experience, in facilitating the recomposition of private portfolios.

Going forward, the strong tailwinds which supported the macroeconomic improvements of several emerging markets during the 2000s (namely accelerating growth in the BRICS, rising commodity prices, improving external balance sheets, and falling real yields in advanced economies) are unlikely to be present in the years to come. Rather, underlying growth fundamentals and macroeconomic management frameworks will be the basis for discrimination by international capital flows. Policy officials should not delay to recover a sustainable growth path and implement structural reforms to increase productivity growth.

Toward a More Stable Global System

During the crisis, much of emerging markets' response capacity, especially in addressing liquidity issues in foreign exchange markets, owed to the multilateral liquidity lines which were set up with the IMF and the Fed during the most turbulent period of the financial shock. Even as several countries entered the great financial crisis in a much stronger position than in the past, central bank swap lines played a hugely important role in providing much-needed foreign exchange liquidity.[28] As effective a measure as self-insurance via reserve accumulation may be, there are clear advantages in strengthening international liquidity provision mechanisms.

Emerging markets are looking to sponsor greater economic development and promote growth; this is complicated if resources need to be locked up in the form of reserves. Cheaper alternatives, more supportive of long-term economic growth, come in the form of reciprocal currency arrangements between central banks and credit lines with the IMF or other international institutions. Additionally, mechanisms such as the IMF's FCL provide strong incentives for governments to improve their countries' fundamentals, while reassuring markets about the country's debt repayment capacity and signaling a high level macroeconomic stability. However, with the current growing divergence between emerging markets' contribution to global GDP and their board representation, the fund's resources will continue to seem less adequate if reforms on this front are not forthcoming.

With regard to central bank cooperation, there is much room for improvement as strictly parochial viewpoints continue to dominate the policy deci-

sions of large central banks. Here too, special responsibility falls with the IMF as it is the only multilateral organization with the mandate and the strength to mitigate the global effects of policy-driven capital flows, both through resources and counsel. So, as post-crisis imbalances threaten havoc in the emerging world in light of a sooner-than-expected exit for the Fed's QE program, the international community should foster a greater level of cooperation if it wishes the recovery to truly gain traction.

References

Allen, William A., and Richhild Moessner (2010). "Central bank co-operation and international liquidity in the financial crisis of 2008-9". *BIS Working Papers*, No. 310. Basel, Switzerland: Bank for International Settlements.

Banco de México (2009). *Financial System Report*. Mexico City, Mexico.

Blanchard, Olivier J., Giovanni Dell'Ariccia, and Paolo Mauro (2013). "Rethinking Macro Policy II: Getting Granular", *IMF Staff Discussion Note*, SDN/13/03. Washington, D.C.: International Monetary Fund.

Federal Reserve Bank of St. Louis (2013). A*fter the Fall. Rebuilding Family Balance Sheets, Rebuilding the Economy. Annual Report 2012*. St. Louis, MO.

Ghosh, Atish R., Marcos Chamon, Christopher Crowe, Jun I. Kim, and Jonathan D. Ostry (2009). "Coping with the Crisis: Policy Options for Emerging Market Countries", *IMF Staff Position Note*, SPN/09/08. Washington, D.C.: International Monetary Fund.

Ghosh, Atish R., Jun Il Kim, Mahvash Saeed Qureshi, and Juan Zalduendo (2008). "Surges", *IMF Working Papers*, No. 12/22. Washington, D.C.: International Monetary Fund.

Institute of International Finance (IIF) (2013a). "Capital Flows to Emerging Market Economies", *IIF Research Note*, January. Washington, D.C.

Institute of International Finance (IIF) (2013b). "Capital Flows to Emerging Market Economies", *IIF Research Note*, June. Washington, D.C.

Institute of International Finance (IIF) (2013c). *Global Economic Chartbook*, May-June. Washington, D.C.

International Monetary Fund (IMF) (2009). "Mexico: 2008 Article IV Consultation", *IMF Country Report*, No. 09/53. Washington, D.C.

International Monetary Fund (IMF) (2012). "The Liberalization and Management of Capital Flows: An Institutional View", *IMF Policy Papers*, November. Washington, D.C.

International Monetary Fund (IMF) (2013). *World Economic Database*, April. Washington, D.C.

Jara, Alejandro, Ramón Moreno, and Camilo Tovar (2009). "The global crisis and Latin America: financial impact and policy responses", *BIS Quarterly Review*, No. 65, pp. 53-68. Basel, Switzerland: Bank for International Settlements.

JP Morgan (2013a). "Trial runs for end of easy money", *Global Data Watch*, May 31.

JP Morgan (2013b). "This fire drill was useful", *Global Data Watch*, June 7.

Kose, M. Ayhan, Prakash Loungani, and Marco E. Terrones. (2013). "The Great Divergence of Policies", *World Economic Outlook*, April, pp. 32-35. Washington, D.C.: International Monetary Fund.

Llaudes, Ricardo, Ferhan Salman, and Mali Chivakul (2010). "The impact of the great recession on emerging markets", *IMF Working Papers*, WP/10/237. Washington, D.C.: International Monetary Fund.

Ortiz, Guillermo (2009). "The Global Financial Crisis – A Latin American Perspective", *BIS Review*, 157/2009. Basel, Switzerland: Bank for International Settlements.

Reinhart, Carmen M., and Vincent R. Reinhart (2008). "Capital Flow Bonanzas: An Encompassing View of the Past and Present", *NBER Working Papers*, No. 14321. Cambridge, MA: National Bureau of Economic Research.

Sidaoui, José, Manuel Ramos-Francia, and Gabriel Cuadra (2010). "The global financial crisis and policy response in Mexico", *BIS Papers*, No. 54, pp. 279-298. Basel, Switzerland: Bank for International Settlements.

Endnotes

[1] Recently, the Federal Reserve Bank of St. Louis documented that of the $13 trillion loss in household net worth in the U.S., to date only 91 percent has been rebuilt in nominal terms and 45 percent when adjusting for inflation and population growth. See Federal Reserve Bank of St. Louis (2013).

[2] For a detailed exposition of the policies implemented during the past half-decade, see Blanchard et al. (2013).

[3] JP Morgan forecasts. See JP Morgan (2013a).

[4] This is roughly the size of Germany for the U.S., Switzerland for the U.K. and Canada for Japan. The European Central Bank's assets are equivalent to the combined annual GDP of South Korea, Indonesia, and Mexico. Data is from IIF (2013c) and IMF (April 2013).

[5] The comparison is with respect to the 1975, 1982 and 1991 global recessions; see Kose et al. (2013).

[6] For a quantitative assessment of emerging markets' growth and advanced economies' liquidity provision contribution to the surge in capital flows, see IIF (2013a). For evidence on the impact of U.S. monetary policy on capital flows to emerging markets, see Reinhart and Reinhart (2008) and Ghosh et al. (2008)

[7] All data on capital flows refer to the database in IIF (2013c), which follows *private net capital inflows* to a sample of 30 countries; figure for 2012 is an estimate. The figure for 2007 is considered an outlier on the basis of it being over two standard deviations above the pre-crisis, 1995-2007, average.

[8] The management of capital flows has become a theme of much policy discussion and has been analyzed from various perspectives. For a thorough discussion of the arguments defining the debate about capital flows management see IMF (2012).

[9] See JP Morgan (2013b)

[10] This is equivalent to 11 percent of GDP.

[11] In terms of GDP, these figures represent 9 percent for Turkey and 12 percent for South Africa.

[12] See IIF (2013b).

[13] Emerging market government and corporate bonds and currencies are proxied though the JP Morgan GBI-EM, CEMBI and EMCI, respectively. Emerging market equity performance is measured through the MSCI index.

[14] As measured by the JP Morgan CEMBI Mexico index.

[15] As measured by the JP Morgan CDX.EM index.

[16] Admittedly, the 1994 bond selloff could be considered a more appropriate precedent on the grounds that its main cause was the initiation of a tightening cycle on part of the Fed, not a financial shock which commenced a global easing cycle. However, the Fed's context is now radically different from what it was 20 years ago, making it extremely unlikely that this tightening cycle will be as aggressive as that of 1994.

[17] See Jara, Moreno and Tovar (2009).

[18] For a comprehensive assessment of emerging markets' management of the great financial crisis see Ghosh et al. (2009) and Llaudes et al. (2010). For a brief account of the episode in the Latin American context see Ortiz (2009).

[19] The increase in risk aversion was amplified by episodes of corporate losses linked to speculation with foreign exchange derivative instruments which threatened to bankrupt firms which had issued a large amount of debt in the commercial money market. This feature of the crisis was also present in the case of Brazil. See Jara, Moreno and Tovar (2009).

[20] It is worth mentioning that the situation was complicated by a third shock to the economy in the form of a swine flu pandemic which halted economic activity for one week during the second quarter of 2009, when real GDP fell by an annualized rate of 9.4 percent.

[21] The initial daily amount of dollars auctioned through this mechanism was $400 million, gradually reduced to $250 million in May 2009, and finally suspended in April 2010.

[22] At the time, oil revenue represented around one third of total government revenue.

[23] Additionally, the government obtained long-term loans from the World Bank and the Inter-American Development Bank. The combined amount of the loans obtained was around $14 billion for 2009, while the IMF's FCL and the Fed's currency swap line took the central bank's support capacity from $80 billion in international reserves in August 2008 to over $150 billion in April 2009.

[24] For a more detailed account of the policy measures implemented by the Mexican government during the great financial crisis see IMF (2009), Banco de México (2009) and Sidaoui et al. (2010).

[25] This figure refers to net private capital outflows by residents.

[26] Foreign currency liabilities are about 5 percent of total liabilities. The sector's capital adequacy ratio has averaged around 16 percent since 2008.

[27] All data for Mexico are from local authorities—primarily the Ministry of Finance, the central bank and the banking regulatory agency (*Comisión Nacional Bancaria y de Valores*).

[28] For an account of the role of central bank cooperation played in the great financial crisis, see Allen and Moessner (2010).