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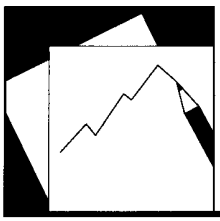

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Unconventional Central Bank Measures for Emerging Economies

Kotaro Ishi, Mark Stone, and Etienne B. Yehoue

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Unconventional Central Bank Measures for Emerging Economies

Prepared by Kotaro Ishi, Mark Stone, and Etienne B. Yehoue[1]

Authorized for distribution by Karl Habermeier

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Abstract

Unconventional central bank measures are playing a key policy role for many advanced economies in the 2007–09 global crisis. Are they playing a similar role for emerging economies? Emerging economies have widely used unconventional foreign exchange and domestic short-term liquidity easing measures. Their use of credit easing and quantitative easing measures has been much more limited. Thus, unconventional measures are much less important for emerging economies compared to advanced economies in achieving broader macroeconomic objectives. The difference can be attributed to the relatively limited financial stress in emerging economies, their external vulnerabilities and their limited scope for quasi-fiscal activities.

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Author's E-Mail Address: kishi@imf.org, mstone@imf.org and eyehoue@imf.org

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I. INTRODUCTION

Advanced economy central banks are taking extraordinary actions in response to the 2007–09 global economic and financial crisis. The Federal Reserve and the European Central Bank, among others, have implemented unprecedented easing measures that have escalated in number, magnitude, and novelty.[2] These measures are unconventional in the sense that they are a clear departure from the policy implementation framework built up by central banks over the past twenty years. They are playing a crucial policy role for those advanced economies facing severe disruptions in monetary policy channels.

Emerging economy central banks also have employed a wide array of unconventional measures. However, they have yet to be documented and assessed, notwithstanding their wide popularity and potentially important policy role.

This paper addresses the question: are unconventional central bank measures playing the same key role for emerging economies as they are for advanced economies? A new database of unconventional measures taken by emerging economies is reported, and a taxonomy of conventional and unconventional measures is developed to facilitate the assessment. The incidence and motivations for unconventional measures by emerging economy and advanced economy central banks are compared.

The conclusion is that unconventional measures are not a panacea for emerging economy central banks in the attainment of macroeconomic objectives. Many of them have employed unconventional measures to help alleviate *liquidity* stresses in foreign exchange and domestic financial markets in the relatively short run and with some apparent success. However, unconventional measures are with only a few exceptions not being used to address the more fundamental *macroeconomic* challenges facing emerging economies. The minimal macroeconomic role for unconventional measures can be attributed to the lower degree of financial stress that emerging economies are experiencing, limits imposed on their policies by inherent external vulnerabilities, and the risks associated with their quasi-fiscal activities.

This paper is structured as follows. Section II provides a taxonomy of unconventional central bank measures taken in response to the financial crisis. Section III documents the unconventional measures undertaken by emerging economies since September 2008, and summarizes the incidence of the unconventional measures across emerging economies. Section IV compares and contrasts the measures of emerging market economies with those of advanced economies and discusses the possible reasons for the differences. Section V

[2] See for example, Chailloux and others (2009); Taylor (2009); Deutsche Bank (2009); and IMF Global Financial Stability Report (October 2009).

provides a preliminary assessment of the effectiveness of unconventional measures in emerging economies, and Section VI provides closing thoughts.

II. A Taxonomy Of Unconventional Measures

A taxonomy of unconventional measures is proposed here because by definition they are different from the conventional measures taken by central banks in more normal times.[3] The approach taken in this paper is to organize the conventional and unconventional measures by policy objective and implementation means (Table 1). Conventional is taken to mean what central banks have usually been doing over the past twenty years or so, when higher standards of independence and transparency took hold (Annex 1).[4]

Systemic financial stress that necessitates the use of unconventional measures rearranges central bank objectives and policy implementation. Under normal circumstances, central banks focus on maintaining price stability, smoothing output in a manner consistent with price stability, and in some cases intervening to reduce volatility in money and foreign exchange markets. Systemic financial stress has impeded monetary transmission, led to a pronounced easing of monetary policy with respect to the macroeconomic price and output objectives, and made financial stability a central policy objective. The change in priorities has been reflected in stepped up liquidity provision. These developments lead to the below three broad categories of unconventional measures.

Liquidity easing

Conventional liquidity easing measures are either market operations aimed at implementing central bank monetary objectives in normal circumstances, or lender of last resort (LOLR) domestic liquidity provision to financial institutions during episodes of stress. A key point here is that the central bank controls domestic liquidity via its legal mandate as the monopoly supplier of local currency reserves. Unconventional liquidity providing measures operate not just on money markets—the standard interface between central banks and the financial sector—but on a much wider gamut of financial markets.

Domestic liquidity easing

Domestic liquidity easing measures are used to stabilize key markets and restore monetary transmission and thus serve both macroeconomic and financial stability ends.

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[3] This taxonomy is an elaboration of that set out in IMF (2009a), Box 1.6.

[4] Meade and Crowe (2008) document the rise of central bank independence and transparency over the past several decades.

- *Systemic domestic liquidity arrangements*—These are aimed at injecting liquidity into the financial system as a whole when conventional monetary transmission channels are blocked. This can be done by relaxing collateral requirements, widening counterparty access to central bank liquidity facilities, and lengthening the term of liquidity providing central bank instruments.

- *Securities liquidity provision*—Central banks have swapped illiquid private sector securities on their books for liquid government securities held by counterparties to stabilize market conditions and unblock monetary transmission. This measure is unusual because central banks have relatively little control over the liquidity of government and private sector securities.

- *Direct instruments in money markets*—With the impairment of interest rate transmission and related market-based policy channels, central banks can resort to direct instruments, such as changing the parameters of the reserve requirement and liquidity frameworks.[5]

Foreign exchange easing

The provision of foreign exchange liquidity is for financial stability purposes. These measures can be quite challenging because they require access to foreign reserve currency which, of course, cannot be created by a non-reserve currency central bank.

- *Foreign exchange liquidity injection*—The central bank can inject foreign exchange to ease severe liquidity stresses in local currency markets. These measures are not always aimed at influencing the exchange rate, but are often indistinguishable from and have similar effects as foreign exchange intervention. They pose a very different set of challenges for central banks compared to traditional central bank domestic liquidity provision, especially with respect to counterparties and terms, and are also limited by the ability of the central bank to access foreign currency (Calvo, 2006; Stone and others, 2009).[6]

[5] While changes in required reserve ratios and liquid asset ratios were used in the past as an instrument of policy, they have become far less commonplace in modern central banking are are thus classed as unconventional measures.

[6] Calvo (2006) draws an important distinction between foreign exchange liquidity easing measures and foreign exchange intervention. A sharp increase in the demand for foreign exchange could simply be met by the sale of central bank foreign reserves into the foreign exchange market, with the market distributing liquidity to the institutions that need it most. However, in the event of a market breakdown and the emergence of information asymmetries, the central bank may be better off circumventing banks and the foreign exchange market and providing foreign exchange liquidity directly to key institutions important for overall economic activity.

- *Cross-central bank currency swap arrangements*—These are bilateral (or in a few cases multilateral) agreements between central banks that in essence involve the provision of liquidity from a reserve currency central bank to another central bank for distribution to local institutions in need of the reserve currency. These measures are different from the others in that they involve more than one central bank, with the liquidity providing central bank effectively in control.

Credit easing

Credit easing is the direct or indirect provision of credit by the central bank to targeted borrowers, possibly necessitated by the breakdown of credit markets. Boosting credit can be viewed as mainly intended to meet macroeconomic objectives. Often, the aim is to reduce credit spreads in specific sectors, such as housing finance, that may be of high macroeconomic importance.

Quantitative easing

Quantitative easing involves the direct and unsterilized purchases of government securities. The key aim is usually to lower the benchmark yield curve and boost economic activity. Quantitative easing is almost always used when monetary transmission is seriously impeded and the policy interest rate is declining towards near zero.

Relationship with other taxonomies

This taxonomy has a finer breakdown of liquidity providing measures compared to others which were developed with advanced economies in mind. For example, Bernanke (2009) and Bini Smaghi (2009) define quantitative and credit easing in terms similar but not identical to those used here. The inclusion of foreign exchange easing measures and direct instruments is necessitated by their widespread use by emerging economy central banks, which are the focus of this paper, although these measures have also been used by some advanced economy central banks. The treatment of securities liquidity and systemic domestic liquidity arrangement measures seems to be original to this paper.

III. The Use of Unconventional Measures in Emerging Economies

The unconventional measures taken by emerging economy central banks are documented in a new database covering 39 mainly medium and large emerging economies for period September 2008 to June 2009 (Table 2).[7] The sources include major newspapers and news search engines, official press releases, and IMF country reports and related studies. The measures are recorded at the date of official announcements to the extent possible, although in some cases, at the date of publication in news sources. Government measures that directly bear on central bank objectives and measures are included as well.

The database shows that most of emerging economy central banks took liquidity easing measures but the use of credit and quantitative easing measures has been rare (Box 1). All but a handful of the emerging economies implemented domestic liquidity easing measures, and most injected foreign exchange liquidity (Table 3). Less than one-third of the emerging economies benefited from cross-central bank currency swaps. Table 4 provides some detailed examples. Only two countries appear to have employed credit or quantitative easing measures.

What explains the incidence of unconventional measures across emerging economies? There is a loose positive relationship between the level of GDP and the overall number of measures (Figure 1). The level of GDP may be serving as a proxy for the depth of the financial system that entails bank and corporate dependence on the availability of short-term financing, and exposure to the financial stress brought on by the global financial shock of the fall of 2008.

The rest of this section looks into the frequency of domestic liquidity easing (excluding reserve requirements), foreign exchange liquidity injection, and cross-central bank currency swap arrangements.[8] The number of credit and quantitative easing measures are too few for regression analysis.

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[7] The database is based on information available as of end-June 2009. The database exclude: (i) what can be viewed as conventional monetary policy easing, (ii) measures aimed directly at bank solvency, (iii) guarantees of medium- and long-term commercial bank liabilities, (iv) supervisory measures intended to boost bank lending, (v) measures unambiguously aimed at providing directed credit to final borrowers (companies and households) by the government; and (vi) specific foreign exchange operations and changes in the exchange rate arrangement. A small number of countries relatively recently classified as advanced are included in the database, including as Czech Republic, Hong Kong SAR, Iceland, Israel, Korea, and Singapore.

[8] There are no clear statistical differences between those countries that eased the domestic reserve requirement framework and those that did not. Some of the largest emerging market countries (Brazil, Korea, and Russia) took domestic liquidity easing measures reflecting impeded market-based monetary transmission. Generally, the use of direct instruments by countries with developed financial sectors are seen as second best because they are not market-based (Habermeier and others, 2009). At the same time, smaller countries (Vietnam and Serbia) may have taken measures owing to inherently weak transmission, and others (Bulgaria, Latvia, Lithuania, and Saudi Arabia) have a fixed exchange rate and thus have less room to lower the policy interest rate.

Domestic liquidity easing measures

Binary dependent variable regressions are used to better understand the frequency of domestic liquidity easing measures.[9] Three classes of explanatory variables are included: (i) GDP and broad money, to capture the country and financial sector size; (ii) international reserves, current account balance, external debt, and credit growth, to capture vulnerabilities; and (iii) the magnitude of exchange rate depreciation and changes in credit-default-swap (CDS) spreads as shock size indicators.

GDP and the level of international reserves help explain the incidence of domestic liquidity easing measures (Table 5). GDP enters as significant and positive for two out of three regression specifications. GDP may be capturing the level of financial sector development and sophistication. The size of international reserves (as a percent of GDP) is associated with a low incidence of liquidity easing measures, possibly because these countries with large holding of international reserves were less susceptible to the impact of foreign exchange shocks—which could in turn have necessitated domestic easing measures.

Foreign exchange liquidity injection measures

A much higher share of inflation targeting countries took foreign exchange liquidity injection measures compared to exchange rate peg countries (Table 6). Some three-fourths of inflation targeting countries implemented them. In contrast, few of the ten currency board or exchange rate target countries implemented foreign exchange liquidity injection measures. The dearth of these measures for exchange rate peg regime countries likely reflects their lack of scope for discretionary provision of foreign exchange.

Measures of foreign exchange market depth and the degree of foreign involvement in domestic financial markets are correlated with the number of measures (Table 7).[10] The median of foreign exchange market turnover is higher for countries that adopted foreign exchange measures compared to the others. Similarly, the amount of trading of government securities accounted for by foreign banks is also much higher for foreign exchange easing countries, including when expressed as a percentage of GDP.

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[9] These regressions are extended and reported in more detail in Yehoue (2009).

[10] According to Kamil and Walker (2009), the provision of foreign exchange by the central bank of Mexico was in part prompted by the magnitude of nonfinancial company losses on derivative currency positions that bet against a depreciation. Companies increased their demand for dollars when asked by their counterparties for additional collateral to cover their mark-to-market losses. The special central bank intervention measures were designed to meet the resulting exceptional demand for dollars, rather than at implementing foreign exchange policy. See also the statement of the Banco de Mexico (www.banxico.org.mx/sitioingles/medidasing.pdf). The central bank of Brazil provided foreign exchange liquidity under similar circumstances (Stone and others, 2009).

Empirically, the incidence of foreign exchange liquidity measures seems to reflect a mix of economies of scale and domestic financial development (Table 5). The significance of GDP across the specifications can be interpreted as suggesting economies of scale that foster the integration of the domestic financial system and private sector balance sheets with international markets. This integration makes local foreign exchange borrowers more vulnerable to foreign exchange shocks, necessitating unconventional measures. Broad money enters significant and negative, possibly because larger domestic financial systems are better able to offset the foreign exchange liquidity shock. The negative and significant parameter estimate for the level of international reserve implies measures are more likely in the absence of a reserve cushion.[11]

[11] The results bring to mind the policy discussions of financial liberalization and capital account sequencing during the 1990s (Johnston and Sundarajan, 1999). The experience of the 1990s suggested that domestic financial sector liberalization should precede capital account opening; otherwise, the local financial system wouldn't be able to handle capital flow volatility.

Box 1. Unconventional Measures Undertaken By Emerging Economy Central Banks

Domestic liquidity easing measures

- *Direct instruments in money markets*—Several central banks relaxed the domestic reserve requirement framework to alleviate domestic liquidity shortages, including cuts in reserve requirement ratios, the introduction of reserve averaging, and an increase in exemption thresholds. In most cases, the easing of reserve requirements was not accompanied by a decrease in the policy interest rate, suggesting that central banks were aiming at easing liquidity rather than changing monetary policy stance.

- *Systemic domestic liquidity arrangements*—These were the most common measures. Many central banks eased the terms of existing standing and market-based liquidity providing facilities (extending maturities, lowering collateral haircuts, increasing frequency of auctions). Eligible collateral was broadened considerably in several cases. Several central banks provided domestic liquidity to targeted institutions who were then expected to distribute it to the market.

- *Government measures that bear directly on liquidity*—In a few cases, the government was actively involved in providing liquidity, including by shifting government deposits into banks for distribution to others, deferring tax payments, and auctioning government securities to banks. Some countries also appeared to adjust debt management to ease liquidity conditions.

Foreign exchange easing measures

- *Foreign exchange liquidity injection*—Many central banks eased the terms of existing foreign exchange facilities (extending maturities, broadening collateral, etc.) and introduced new foreign exchange liquidity facilities, such as dollar repo and swap facilities. Counterparties were widened, to include nonbank financial institutions and key nonfinancial institutions (e.g., exporters or energy importers). Foreign exchange liquidity limits were relaxed, including by removing the ceilings on bank purchases of offshore foreign exchange and easing capital inflow limits. A few governments also transferred foreign currency deposits held overseas to domestic banks, guaranteed foreign exchange liabilities of banks and exporters, and lowered taxes on foreign exchange transactions. Furthermore, some central banks lowered the required reserve ratio for bank foreign currency liabilities and shifted the currency structure of required reserves away from foreign exchange.

- *Cross-central bank currency swap arrangements*—The Federal Reserve established dollar swap arrangements with central banks in Brazil, Korea, Mexico, and Singapore (as well as with 10 advanced countries), while the European Central Bank and the Swiss National Bank each provided euro liquidity to Hungary and Poland. These arrangements facilitated the implementation of foreign exchange easing measures in emerging economies, as the liquidity receiving central banks distribute the foreign exchange to local counterparties in need.[12] Some central banks entered into arrangements termed swaps, but are actually more akin to trade credits, and are thus not covered here.

Credit and quantitative easing measures

The use of credit and quantitative easing measures by emerging economy central banks has been minimal. The Bank of Korea purchased corporate debt and commercial paper. The Bank of Israel was the only central bank in the sample that undertook quantitative easing beginning in March 2009 and ending in August 2009.

[12] See Aizenman and Pasricha (2009) and Obstfeld and others (2009) for discussions about financial instability and central bank swap lines.

Cross-central bank currency swap arrangements

The incidence of foreign exchange swaps is driven at least as much by the decisions of the reserve currency central bank as by those of the liquidity receiving central bank. Liquidity providing central banks have not been explicit about their motivations for providing foreign exchange liquidity to other central banks. From a risk management perspective, liquidity providing central banks may be focusing on the size of economies and the magnitude of the adverse shock. Reserve currency central banks may be inclined to provide support to larger economies because their market stresses are more likely to spill over into other countries. Indeed, five of the largest eight emerging economies, out of a total of 39 in the database, benefited from cross-central bank foreign exchange swaps. In addition, a larger shock would raise the likelihood of spillover, thus raising the likelihood of support from reserve currency central banks.[13]

The regression results provide some support for the risk management approach. The estimated coefficients on the GDP variable reported in Table 6 are robust across alternative specifications and suggests that the liquidity receiving emerging economies tended to be larger. The significant parameter estimates for exchange rate depreciation and credit growth could serve as crude indicators of the magnitude of shocks.

IV. Differences in the Use of Unconventional Measures Between Emerging and Advanced Economies

There are clear differences between emerging economy and advanced economy central banks in the timing and types of unconventional measures. These differences seem to be related to financial stress and policy credibility.

Timing

Advanced economies loosened monetary policy using conventional tools early in the crisis, and switched to unconventional measures after the failure of Lehman. The advent of global financial stress led the Federal Reserve to reduce the cost and extend the term of access to its primary credit facility in August and lower the target federal funds rate in September 2007 (Figure 2, top panel). The European Central Bank and the Bank of England followed suit in subsequent months. The Lehman failure in September 2008 compelled some advanced economy central banks to shift the focus of monetary policy from conventional to unconventional measures. Unconventional liquidity easing was especially important for those

[13] Aizenman and Pasricha (2009) concluded that the exposure of U.S. banks is the most important empirical determinant of the selection of the four emerging market countries that set up foreign exchange swaps with the Fed vis-à-vis other countries.

central banks compelled to lower interest rates to near zero. The rapid economic contractions led to credit easing and quantitative easing measures early in 2009 (Figure 3, top panel).[14] [15]

Emerging market economies were actually *raising* policy interest rates through September 2008, after which they utilized unconventional and then conventional measures. Prior to September 2008, emerging market economies were grappling with capital inflow and inflationary pressures (Habermeier and others, 2009). They initiated unconventional measures only in September 2008 in response to the sudden tightening of global liquidity (Figure 3, bottom panel). As stress in global dollar markets intensified, foreign exchange liquidity available in local markets quickly dried up, as shown by the rise in the costs of onshore dollar financing (Figure 4). Exchange rates came under pressure and net capital inflows began to reverse (Figure 5). Corporations not only had trouble obtaining dollars to make debt payments but were also virtually cut off from import and working capital financing. Domestic easing measures generally lagged foreign exchange easing measures.[16] Meanwhile, policy interest rates were reduced in many economies beginning only in November 2008, suggesting that conventional domestic monetary policy easing lagged unconventional measures.

Types

Both advanced and emerging economies employed a variety of *liquidity easing* measures but there were important differences in the profile. Emerging economy central banks seemed to rely more on direct instruments such as the easing of reserve requirements compared to advanced economies. Advanced economies approaching the zero lower interest rate bound introduced systemic liquidity easing measures like widening the availability of counterparties and extending the maturity of liquidity providing operations on a large scale. Some emerging economy central banks took these measures but not to the same extent. Advanced economies undertook securities liquidity provision, while apparently no emerging economy central banks did so. Both advanced and emerging market central banks undertook foreign exchange easing measures. Central banks from both groups of economies undertook liquidity arrangements with reserve currency central banks.

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[14] The use of unconventional measures by advanced countries is described in Chailloux and others (2008), IMF (2008), IMF (2009a), and IMF (2009b).

[15] In 2000, Japan used quantitative easing and aimed at a specific level of excess bank reserves as an "operating target." During the current crisis, advanced country central banks have employed quantitative easing generally using interest rates or quantities as broad operating targets (e.g., Bernanke, 2009).

[16] Corporations and banks were forced to move from borrowing directly in uncollateralized dollar cash markets to borrowing in their local currency's uncollateralized cash market and then converting the proceeds into a dollar obligation through a foreign currency basis swap (DBS Research Group, 2009).

The key difference is the use of *credit and quantitative easing* measures: several advanced economy central banks relied heavily on these measures, whereas they were barely used by emerging economy central banks. Early in 2009, after policy interest rates dwindled to near zero, the Federal Reserve and Bank of England made large purchases of government securities, and the Federal Reserve also effectively provided credit of a large magnitude via several new facilities. On the contrary, no emerging economy central banks, except Israel for a relatively brief period (March to August, 2009) implemented quantitative easing measures, and only a few emerging economy central banks seemed to have introduced what can be viewed as credit easing measures.

Magnitude

The differential uses of conventional measures can be seen in the shifts in the size of central bank balance sheets. Conventional monetary policy easing for most central banks has a very limited impact on balance sheet size reflecting the importance of the expectations channel (Stella, 2009). In contrast, most unconventional measures lead to an expansion in central bank balance sheets.[17] Thus, central bank balance sheet size can be used as a broad proxy for the magnitude of the use of unconventional easing.

The balance sheets of central banks in advanced economies began to swell in September 2008, and much faster than those of emerging economies (Figure 6). The expansion of advanced economy central bank balance sheets is generally attributable both to increases in reserve money from unconventional measures and to central bank foreign exchange swaps. The sizes of emerging economy central balance sheets have increased by much less due to the near absence of quantitative and credit easing measures and the rundown in international reserves in many cases.

Explanations for the differential use of unconventional measures

What explains the differences in the application of conventional and unconventional measures between advanced and emerging economies? These differences seem to be rooted in varied degrees of financial and external vulnerabilities and policy credibility.

[17] Most, but not all, unconventional measures increase the size of central bank balance sheets. Domestic currency liquidity easing (for example through extending maturities or broadening counterparties) will lead to an increase in bank reserves at the central bank as well as claims of the central bank on financial institutions. Quantitative easing and credit easing both boost bank reserves at the central bank with the counterpart of higher central bank holdings of government securities and private credit, respectively. Cross-central bank foreign exchange swaps increase balance sheets of both central banks. In contrast, securities liquidity provision (the exchange of government securities on the books of central banks for private securities held by banks) does not alter the size of the central balance sheet. The provision of foreign exchange shrinks the central bank balance sheet, although these actions are often sterilized.

Impeded monetary transmission and alarmingly rapid economic contraction forced advanced economy central banks to move to unconventional measures. During normal circumstances when financial markets are functioning properly, a change in the central bank policy rate (typically an overnight rate) transmits through interbank and money market interest rates, influencing consumer and business lending rates and domestic demand, and ultimately impacting inflation and output. However, the jump in TED spreads (the difference between three-month LIBOR and three-month treasury-bill rates) in late 2008 for the advanced economies indicates that monetary transmission was severely disrupted (Figure 7). [18] [19] Weak transmission led many advanced economy central banks to lower policy interest rates to (near) the zero lower bound. Further, a looming collapse in economic activity and the prospects of deflation (Figures 8–11) made a further loosening of monetary conditions critical. The combination of the lack of scope for further interest rate reductions and the rapid macroeconomic contraction led central banks to resort to credit and quantitative easing.

Emerging economy central banks faced less disrupted monetary transmission and their policy rates did not reach the zero lower bound, but their macroeconomic situation in many cases was even worse. Their TED spreads rose but not to the same heights as in the advanced economies. They also faced rapid contractions in GDP and slowdowns of real private credit growth. Why didn't the sharp slowdowns in growth lead to unconventional measures?

Crucially, emerging economies' scope of for unconventional measures for macroeconomic ends is constrained by their inherent vulnerabilities and policy credibility limits. The zero interest rate bound was reached by only a few emerging economies and policy rates remained at around 6 percent on average, reflecting an average inflation rate of around 5 percent. Interest rates had to remain high enough to compensate for holding risky currencies. The higher degree of external vulnerability can be seen in credit ratings; for example, Fitch scores the median of long-term currency ratings for emerging economies at BBB, just on the edge of an investment grade (Figure 12). Indeed, the degree of policy interest rate easing for emerging economies is inversely related to the their external vulnerability, as gauged by sovereign CDS spreads. External vulnerabilities very much narrow the scope for emerging economy central banks to take systemic domestic liquidity easing, quantitative easing, or credit easing measures because the extra liquidity can lead to capital outflows.[20]

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[18] In the large advanced countries over the last twenty years, the emergence of near-banks, the shift of banks toward market financing, and the shortening of the term of market liabilities increased the vulnerability of monetary transmission to shocks (IMF 2008, Chapter 2).

[19] IMF (2008) and IMF (2009a) document the higher levels of financial stress in advanced countries compared to emerging economies.

[20] In Russia, according to press reports, the extra domestic liquidity provided by systemic liquidity easing measures, in the context of the prolonged sequence of policy-induced exchange rate depreciations, may have been converted to foreign exchange, undermining external vulnerability.

The unpleasant history of emerging economies with quasi-fiscal activities may also help explain their limited use of unconventional, especially credit easing, measures. During the 1970s and 1980s, central banks, in particular those of emerging economies, undertook a variety of quasi-fiscal roles, including implementing direct credit policies (Fry, 1993 and Mackenzie and Stella, 1996). These roles were seen as compromising central bank independence and monetary policy objectives.

V. Effectiveness of Unconventional Measures for Emerging Economies

The effectiveness of unconventional measures is exceedingly hard to measure. The transmission of conventional monetary and exchange rate policy even during normal times is not fully understood.[21] For unconventional measures, the high degree of uncertainty associated with financial stress means that a good part of their effect rests on boosting confidence, and this is difficult to quantify. Discussion of the effectiveness of unconventional measures for advanced economies tends to focus on price and quantity indicators of markets specifically targeted by measures, and on broader credit indicators (Bernanke, 2009). The small but growing empirical literature on the effectiveness of unconventional measures for advanced economies is necessarily tentative and preliminary and has yielded mixed results.[22]

There is limited empirical analysis of the effectiveness of unconventional measures for emerging economy central banks. In Brazil and Korea, onshore dollar interest rates came down to pre-crisis levels (Figure 4, bottom panel). For Brazil, Stone and others (2009) concluded that both the announcement and the implementation of foreign exchange easing reduced the local cost of dollar borrowing. However, in addition to the measures taken by emerging economy central banks, the easing of dollar liquidity conditions likely reflected a mix of the monetary loosening measures taken by the U.S., the reduction of the federal funds rate to near zero, and the global economic contraction.

The central bank foreign exchange swaps seem to have been viewed as a positive signal about the credibility of the liquidity receiving country. The cost of local dollar funding in Brazil and Korea dropped considerably for the ten-day period after the announcement of the Federal Reserve foreign exchange swaps on October 29 compared to the preceding ten days (Table 8). This drop greatly exceeded a decline in the U.S. dollar OIS rate, suggesting that

[21] Kuttner and Mosser (2002) provide a comprehensive review of transmission channels for large advanced countries. IMF (2008) and Cihak and others (2009) analyze how monetary transmission for large advanced countries has been impacted by the global crisis.

[22] Aït-Sahalia and others (2009) concluded that the liquidity provision measures of the Fed did not reduce Libor-OIS spreads for the financial system as a whole. Artuç and Demiralp (2009) found that the easing of liquidity conditions by the Fed via the Primary Credit Facility did improve money market conditions.

the alleviation of dollar liquidity tightness in Brazil and Korea was not entirely due to international conditions. Obstfeld and others (2009) conjecture that the Federal Reserve facilities served as a positive signal for the emerging economy recipients. Stone and others (2009) found that the announcement of the swap agreements between the Federal Reserve and the Banco Central do Brasil reduced the relative cost of local dollar funding by more than 300 basis points.

Domestic liquidity easing measures were followed by an easing of conditions in many economies, but their impact is difficult to disentangle from other factors. In Brazil and Korea, the easing of money market conditions can be attributed not only to the systemic liquidity easing measures, but also to lower policy interest rates (partly made possible by the easing of U.S. interest rates in the context of weak growth), and policy credibility. In Russia, in contrast, the money market rate increased, notwithstanding the spate of easing measures, probably due to waning confidence in the ruble, which led to a tightening of the policy interest rate.

VI. Closing Thoughts

There is no doubt that unconventional central bank measures have played a crucial policy role for some advanced economies in the crisis of 2007–09. Emerging economies have also been affected by the global crisis and are facing economic contractions even larger than those of advanced economies. Are—and should—emerging economy central banks use the same type and magnitude of unconventional measures as their advanced economy counterparts?

Unconventional *liquidity easing* measures by emerging economy central banks can and have apparently played a useful role. The reliance of the financial and corporate sectors in many of the larger emerging economies on foreign financing leaves them vulnerable to a cutoff of such financing, with serious repercussions for economic activity. This vulnerability can warrant short-term central bank provision of foreign exchange and domestic liquidity on financial stability grounds. However, prolonged and sizable liquidity easing can be counterproductive because emerging economies are prone to large and potentially destabilizing capital outflows. Cross-central bank swaps seem to have been helpful, but their provision is not under the control of the liquidity receiving economies. Direct instruments, such as reserve requirement changes may also be useful but can have negative side effects.

The case for *credit easing* in emerging economies is much weaker. Credit policy objectives are better handled by the fiscal authorities rather than the central bank. This is especially so for many emerging economies for which the tradeoffs between, price, fiscal, and financial stability objectives are sharper. There seems to be a general recognition that a return to the policies of the 1970s and 1980s—when central banks were subject to a loss of autonomy and high inflation—should be avoided.

Quantitative easing may be less appropriate for most emerging economies. First, financial stress has been less severe and underlying inflation higher, so only few countries have had to move to a near zero policy interest rate. Second, the vulnerability of emerging economies to external shocks requires that policy rates be kept at a level sufficient to compensate currency holders for exchange rate risk. Indeed, quantitative easing can lead to capital outflows for externally vulnerable emerging economies. Against this background, it is telling that the only emerging economy that adopted quantitative easing, Israel, is one of the most advanced of this group.

More broadly, emerging economy central banks do not enjoy the credibility that affords the use of many less transparent and highly discretionary unconventional measures. As of late 2009, the revealed preference of emerging economies was not to employ quantitative easing and credit easing. While circumstances may change, these types of unconventional measures have thus far not played as important a policy role in emerging as advanced economies. Most of the policy challenges and tools faced by emerging economy central banks during the crisis of 2007–09 are familiar from past crises, and just as difficult (Boorman and others, 2000).

Finally, the use of unconventional measures by emerging economy central banks raises difficult analytical issues with which central bankers and researchers will be grappling for some time to come. Striking the right balance between domestic liquidity easing measures and external vulnerability is especially delicate. Whether a foreign exchange liquidity shortfall should be addressed through standard market intervention or by direct provision to important counterparties touches on LOLR and exchange rate policies. Gauging the effectiveness of unconventional measures is important for policy design and accountability. All of these considerations will need to be built into crisis management frameworks. In particular, there is the question of how to best weave emergency foreign exchange and securities liquidity provision into the traditional LOLR framework.

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Table 1. Central Bank Conventional and Unconventional Measures

	Conventional measures			Unconventional measures					
				Domestic liquidity easing measures			Credit easing measures	Quantitative easing measures	
Price and output stability	***Domestic open market operations and standing facilities*** Rationale: to achieve nominal anchor. Operational target: policy interest rate. Example of instruments: repos, lending, and issuance of central bank bills.	***Open market foreign exchange operations*** Rationale: to achieve nominal anchor and/or smooth exchange rates. Operational targets: exchange rate anchor or exchange rate volatility Example of instruments: cash, swaps, derivatives.	***Direct instruments (mostly in shallow domestic financial markets)*** Rationale: to complement domestic open market operations and standing facilities. Example of instruments: reserve requirements and credit ceilings.	***Direct instruments in money markets*** Rationale: to enhance monetary transmission and restore market stability. Example of instruments: reserve requirements and regulatory liquidity ratios.	***Systemic domestic liquidity arrangements*** Rationale: to enhance monetary transmission and restore market stability. Example of instruments: unlimited domestic liquidity provision, broadening of counterparties, and easing of collateral requirements.	***Securities liquidity provision*** Rationale: to enhance monetary transmission and restore market stability. Example of instruments: exchange of illiquid for liquid securities.	***Credit easing measures*** Rationale: to enhance monetary transmission and restore credit market functioning. Example of instruments: purchase of targeted private securities, direct credit provision, provision of liquidity to investors in targeted securities.	***Quantitative easing measures*** Rationale: to enable monetary transmission when the policy rate approaches the zero lower bound. Example of instruments: unsterilized outright purchase of government securities and of foreign exchange.	
Liquidity conditions	***Domestic LOLR to institutions and markets*** Rationale: to ease financial institutions or market liquidity stress. Example of instruments: discretionary lending.							***Foreign exchange easing measures***	
								Foreign exchange liquidity injection Rationale: to ease foreign exchange liquidity pressures. Example of instruments: unlimited liquidity provision, broadening of collateral and counterparties.	***Cross-central bank currency swap arrangements*** Rationale: to support national banks' foreign exchange operations. Example of instruments: swaps.

Source: IMF, Monetary and Capital Markets Department.

Table 2. Emerging Economy Coverage

Argentina	Iceland	Poland
Brazil	India	Romania
Bulgaria	Indonesia	Russia
Chile	Israel	Saudi Arabia
China, People's Rep. of	Kazakhstan	Serbia, Republic of
Hong Kong SAR, People's Republic of China	Korea	Singapore
	Latvia	South Africa
Colombia	Lithuania	Thailand
Costa Rica	Malaysia	Turkey
Croatia	Mexico	Ukraine
Czech Republic	Nigeria	Uruguay
Egypt	Pakistan	Vietnam
Estonia	Peru	
Hungary	Philippines	

Source: IMF, Monetary and Capital Markets Department.

Table 3. Number of Measures Implemented—September 2008 to May 2009[23]

	Domestic liquidity easing measures		Foreign exchange easing measures		Credit and quantitative easing measures
	Domestic instruments and systemic domestic liquidity arrangements	Government	Foreign exchange liquidity injections	Cross-central bank currency swap	
Africa					
Nigeria	7		3		1
Asia					
China	4		1		
Hong Kong SAR	3		1	1	
India	5		7	1	
Indonesia	11		4		
Korea	5		4	5	
Malaysia	3				
Philippines	3		4		
Singapore				2	
Vietnam	1		1		
Europe					
Bulgaria	2				
Croatia	5				
Czech Republic	1				
Estonia				1	
Hungary	4	1	5	1	
Iceland				2	
Israel	4				2
Latvia	2			2	
Lithuania	1	1			
Poland	6		1	2	
Romania		1	1		
Russia	9	5	1		
Serbia	1	1	3		
Turkey			6		
Ukraine	1	2	2		
Middle East					
Saudi Arabia	2				
Latin America					
Argentina	1		2		
Brazil	12	2	9	2	
Chile	3		7		
Colombia	1				
Mexico	1		1	2	
Peru	3		3		
Uruguay	1				

Source: Central bank websites, Factiva, and IMF country papers.

[23] See [web link] for the database. The number of measures should not be interpreted as a precise gauge of the magnitude of policy responses. No reported measures for South Africa, Costa Rica, Egypt, Kazakhstan, Pakistan, and Thailand.

Table 4. Examples of Unconventional Measures

Type	Examples of measure	
	Country and timing	Measure
Domestic liquidity easing	Nigeria (Sep. 2008)	-The central bank reduced reserve requirements from 4 to 2 percent.
Direct instruments in money markets	China (Sep.–Dec. 2008)	-The central bank continued to reduce reserve requirements.
	Hungary (Oct. 2008)	-The central bank reduced reserve requirements from 5 to 2 percent.
Systemic domestic liquidity arrangements	Philippines (Oct. 2008)	- The eligible collateral for the central bank's standing repo facility was expanded to include foreign currency denominated sovereign debt securities.
	Chile (Oct. 2008)	- The central bank broadened the list of eligible collateral for monetary operations to include commercial papers.
	Israel (Feb. 2009)	- The central bank announced that it would transact open market operations with government debt of different types and maturities.
Government measures that bear directly on liquidity:	Russia (Sep. 2008)	-The government placed a large amount of government deposits at the three largest state owned banks.
	Mexico (Oct. 2008)	- The government stated guarantee program for commercial papers.
Foreign exchange easing	Brazil (Sep. 2008)	-The central bank announced plans to sell one month dollar liquidity lines.
Foreign exchange liquidity injection	Philippines (Oct. 2008)	-The central bank approved the opening of a dollar repo facility.
	Turkey (Oct. 2008)	-The central bank began daily dollar selling auctions.
	India (Oct. 2008)	- The central bank allowed local banks to borrow funds from their overseas branched up to an amount equal to 50 percent of their Tier 1 capital or $10 million, whichever is higher.
	Chile (Oct. 2008)	-The government announced that it would shift $1 billion from foreign banks to four local banks.
	Hungary (Apr. 2009)	-The government announced that it would provide 170 billion forint in foreign current to state-owned development bank.
	Indonesia (Oct. 2008)	-The central bank reduced the foreign exchange reserve requirement for commercial banks by 2 percent to 1 percent.
	Serbia (Oct. 2008)	-The central bank reduced required reserves against foreign assets.
Cross central bank currency swap arrangements	Brazil, Mexico, Korea, and Singapore (Oct. 2008)	- Federal Reserve, the Banco Central do Brazil, the Banco de Mexico, the Bank of Korea, and the Monetary Authority of Singapore established temporary reciprocal swap lines up to $ 30 billion.
Credit and quantitative easing	Korea (Nov. 2008)	- The central bank announced that it would provide up to $3.3 billion to a bond fund to purchase commercial papers.
Credit easing	Israel (Mar. 2009)	- The central bank announced that it would purchase government bonds (a daily average of NIS 200 million).
Quantitative easing		

Sources: Central bank websites, Factiva, and IMF country papers.

Table 5. Regression Results

	Domestic liquidity easing			Foreign exchange liquidity injection					Cross-central bank foreign exchange swap			
GDP 2008	0.0004	0.0004	0.0004	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(1.63)	(2.13)**	(2.01)**	(3.19)***	(1.78)*	(1.84)*	(4.5)***	(4.54)***	(2.1)**	(2.78)**	(3.65)***	(3.97)***
Exchange rate depreciation	-0.010	-0.013		-0.027	-0.017	-0.012	-0.020		-0.063	-0.058	-0.060	-0.042
	(-0.64)	(-0.94)		(-1.87)*	(-1.1)	(-.81)	(-1.59)		(-2.3)**	(-2.84)**	(-2.71)**	(-2.29)**
CDS Spreads	6.98E-05			-0.0001	-4E-07				-0.003	-0.003	-0.003	
	-0.4			(-0.51)	0				(-1.29)	(-1.4)	(-1.44)	
Reserves/GDP ratio	-0.043	-0.042	-0.048	-0.027	-0.043	-0.047	-0.045	-0.055	0.035	0.029	0.028	0.033
	(-1.97)**	(-1.97)**	(-2.57)***	(-0.93)	(-2.44)**	(-2.29)**	(-1.75)*	(-2.32)**	(1.31)	(1.71)*	(1.79)*	(2.22)**
Current Account/GDP ratio	-0.010			0.025	0.021				0.004			
	(-0.42)			(1.02)	1				-0.12			
External Debt	0.004	0.004	0.005		0.002	0.003			-0.001			
	(1.71)*	(1.64)	(2.1)**		(0.89)	(0.99)			(-0.29)			
External Debt/GDP ratio				-0.007								
				(-0.78)								
Change in credit/GDP ratio	-0.005	-0.004		0.015	0.002				0.025	0.024	0.023	0.013
	(-1.14)	(-0.9)		(0.90)	(0.39)				(2.85)**	(3.05)**	(3.49)***	(6.21)***
Broad money/GDP ratio	0.003			-0.110	-0.107	-0.105	-0.108	-0.112	-0.010	-0.008		
	(0.15)			(-3.94)***	(-4.1)***	(-4.46)***	(-4.58)***	(-4.25)***	(-0.44)	(-0.35)		
Pseudo R2	0.27	0.27	0.25	0.40	0.40	0.39	0.38	0.35	0.39	0.39	0.39	0.29
Number of observations	39	39	39	39	39	39	39	39	39	39	39	39

Source: Authors' estimates.

1/ Significance level, (*) at 10 percent; (**) at 5 percent; and (***) at 1 percent.

Table 6. Nominal Anchors and Incidence of Measures

(Percent share of countries with measures)

Nominal anchor	Number of countries	Domestic liquidity easing measures	Foreign exchange easing measures		
			Foreign exchange liquidity injection	Cross-central bank currency swap arrangements	Credit and quantitative easing measures
Inflation targeting	16	81.3	68.8	31.3	6.3
Currency board	4	75.0	25.0	50.0	0.0
Exchange rate anchor other than currency board	6	66.7	33.3	16.7	0.0
Other anchor	13	61.5	38.5	23.1	0.0

Source: The author's calculation.

Table 7. Indicators of International Financial Market Integration and the Incidence of Foreign Exchange Easing Measures

(Country group medians)

		Foreign exchange market turnover (April 2007)		Local government security market trading of foreign banks (2005)	
	2008 GDP (in billions of US dollars)	2008 GDP (in billions of US dollars)	Multiple of GDP	In billions of US dollars	Multiple of GDP
With foreign exchange measures	320	1,859	4.4	271	1.4
Without foreign exchange measures	175	747	5.2	46	0.4

Sources: BIS; Emerging Market Trading Association; and the author's calculation.

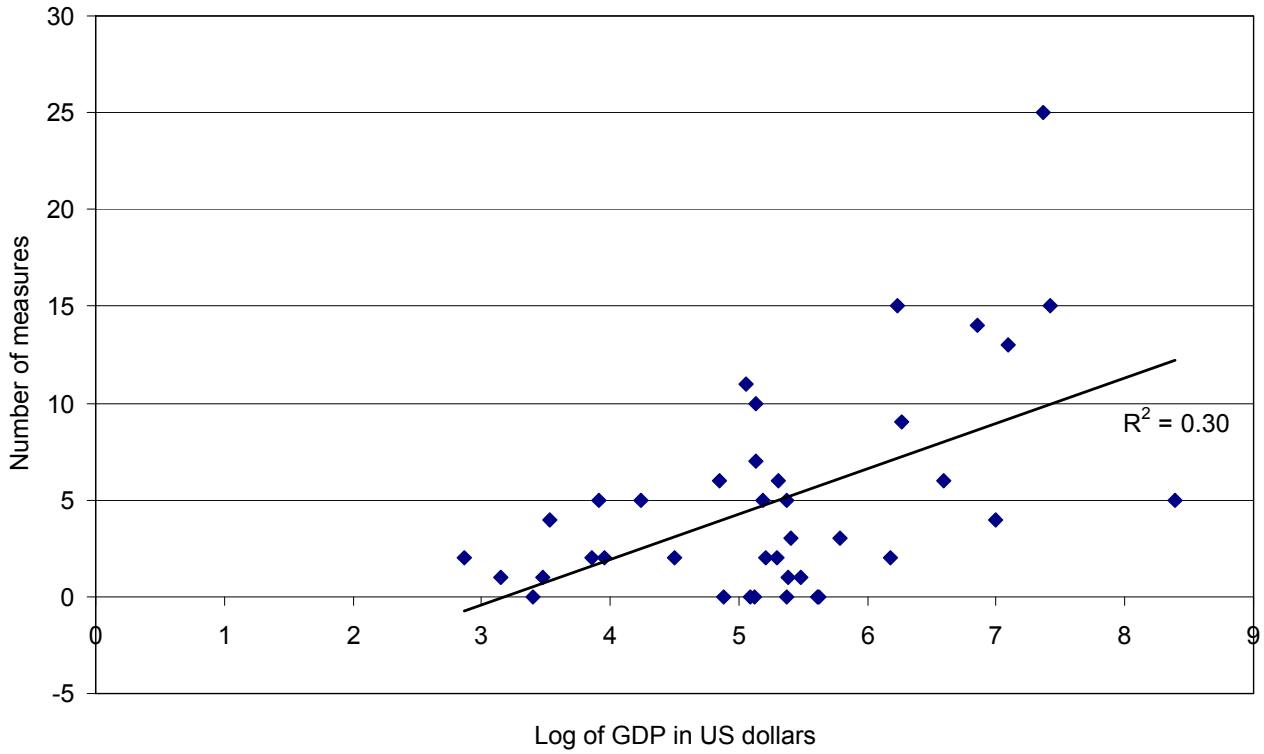
Table 8. United States, Brazil, and Korea: Cost of Local Dollar Financing

(October 2008)

	United States (3-month OIS)	Brazil (3-month onshore dollar interest rate)	Korea (Implied 3-month dollar rate)
10 days before Oct 29	1.02	6.43	10.79
10 days during and after Oct 29	0.59	4.60	8.45
Difference	-0.43	-1.83	-2.34

Source: Bloomberg.

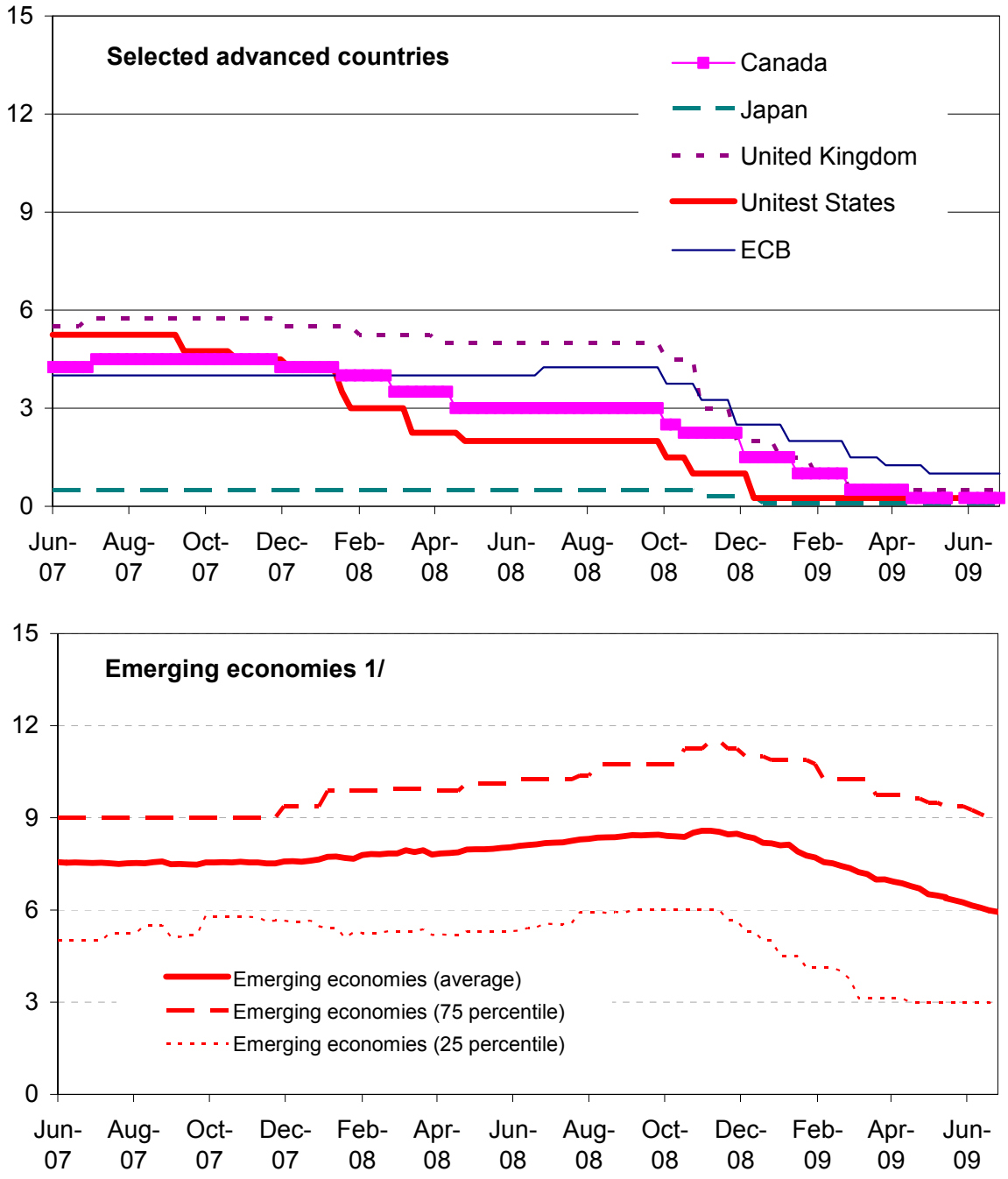
Figure 1. Emerging Economies: Unconventional Measures and GDP



Sources: IMF World Economic Outlook database and staff estimates.
1/ The sample countries are all countries in Table 2.

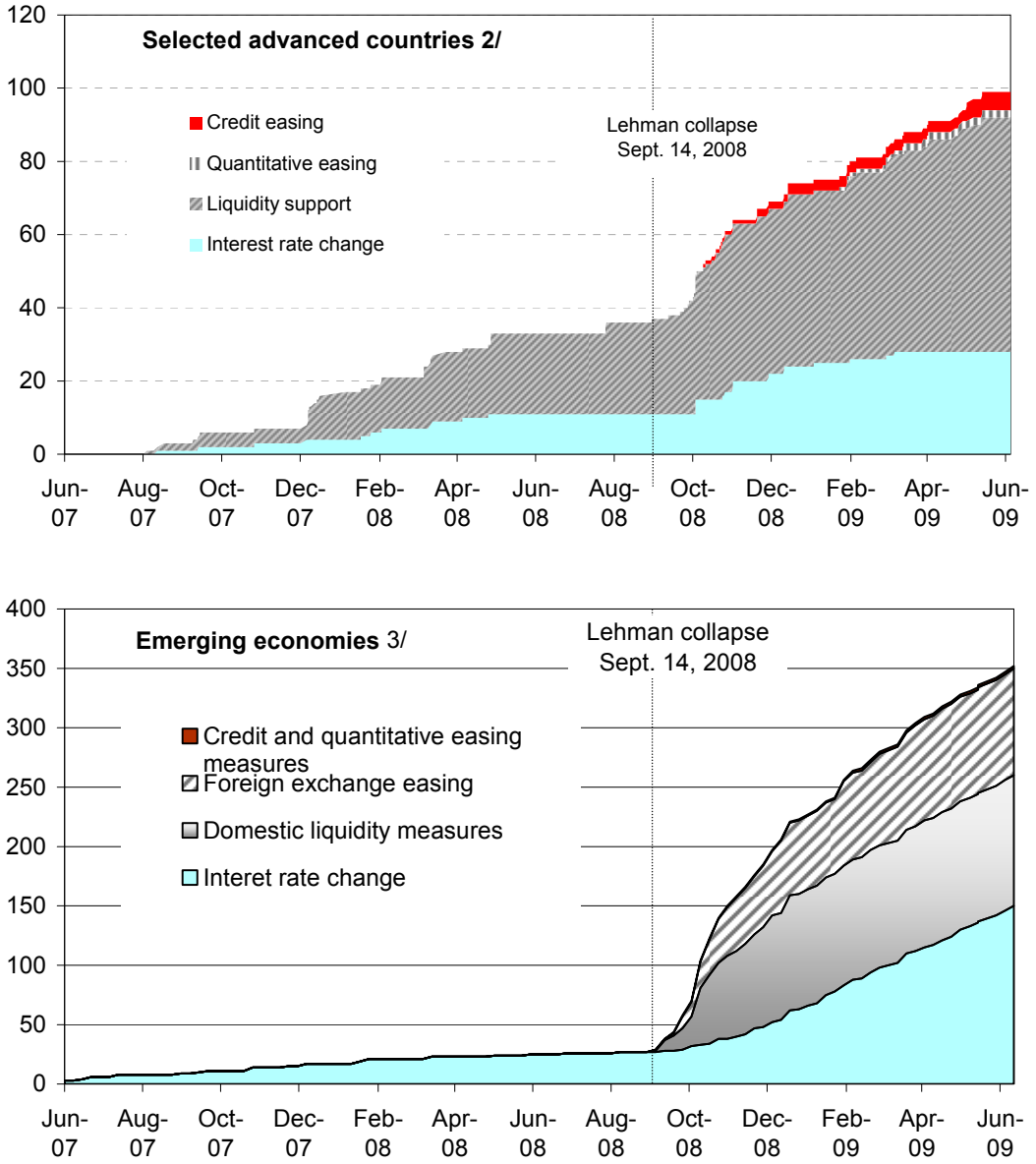
Figure 2. Monetary Policy Rates, June 2007–June 2009

(In percent)



Sources: Bloomberg and the authors' estimates.
1/ Emerging economies include all countries listed in Table 2, except Argentine, Bulgaria, Costa Rica, Estonia, Lithuania, Pakistan, Singapore, and Vietnam.

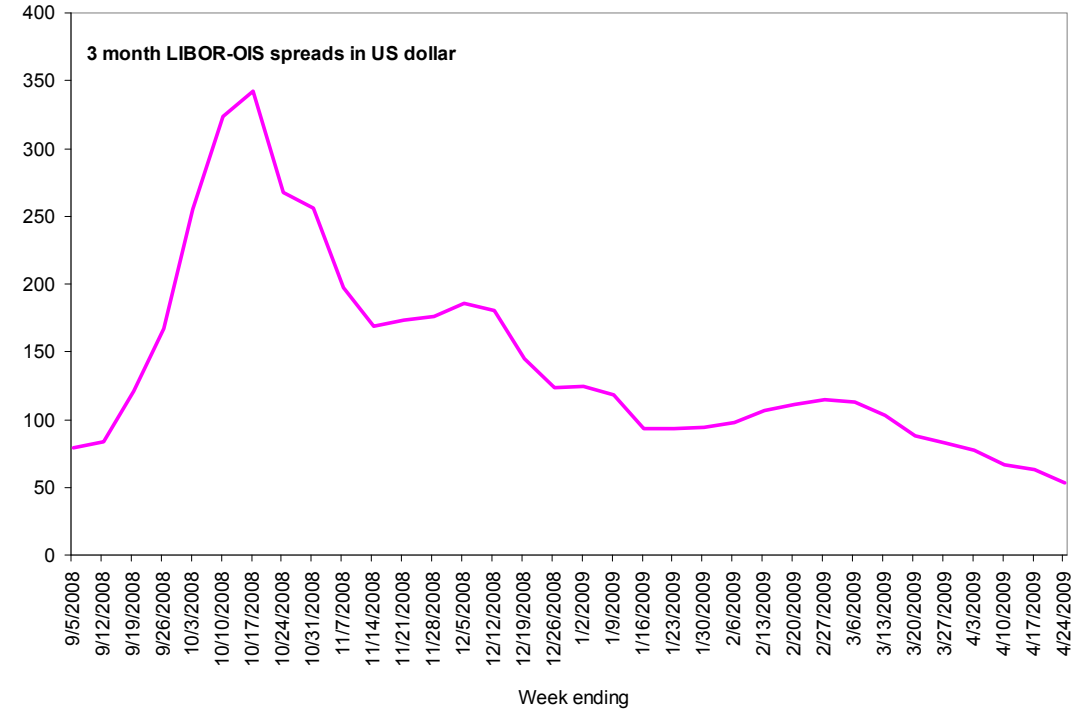
Figure 3. Cumulative Counts of Conventional and Unconventional Measures, June 2007–June 2009 1/

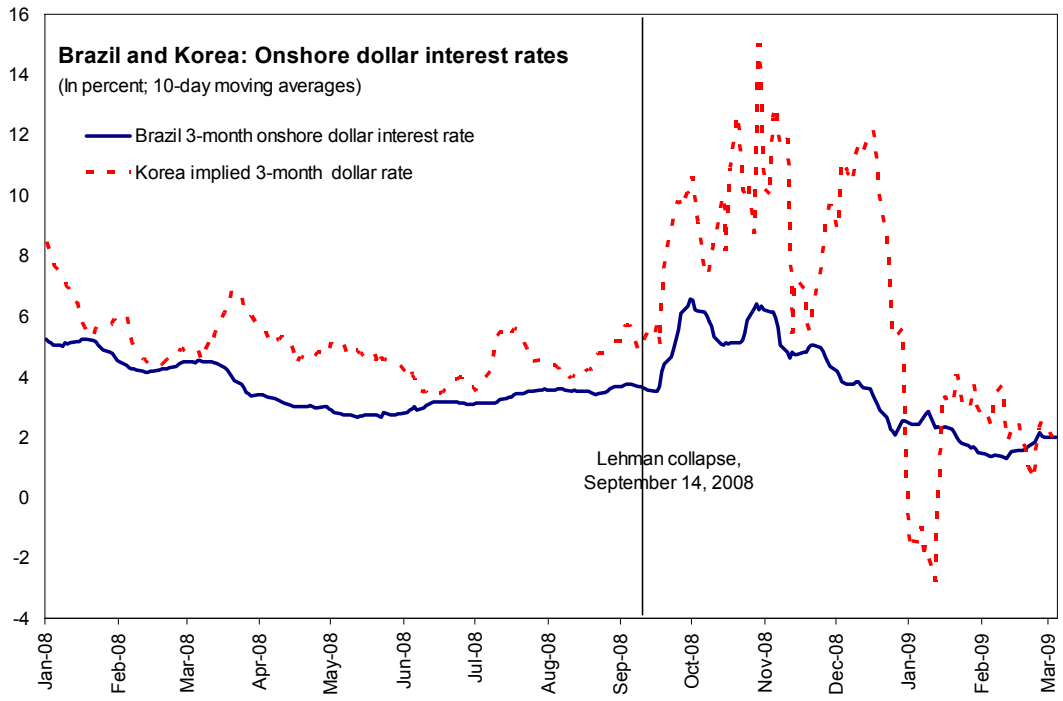


Sources: IMF 2009 October Global Financial Stability Report Chapter III (above figure) and the authors' estimates (bottom figure).
1/ Due to different in estimation methodologies and sample size, the numbers for advanced countries and emerging economies are not comparable.
2/ Euro area, Japan, Sweden, Switzerland, U.K., and U.S.
3/ For "Interest rate change," emerging economies include all countries listed in Table 2, excluding Argentine, Bulgaria, Costa Rica, Estonia, Lithuania, Pakistan, Singapore, and Vietnam. Data for unconventional measures (credit and quantitative easing, foreign exchange easing, and domestic liquidity easing) prior to August 2008 are not included, as the incidence of these measures is very low.

Figure 4. Emerging Economies: Three-month LIBOR-OIS Spread and Onshore Dollar Interest Rates, January 2008–April 2009

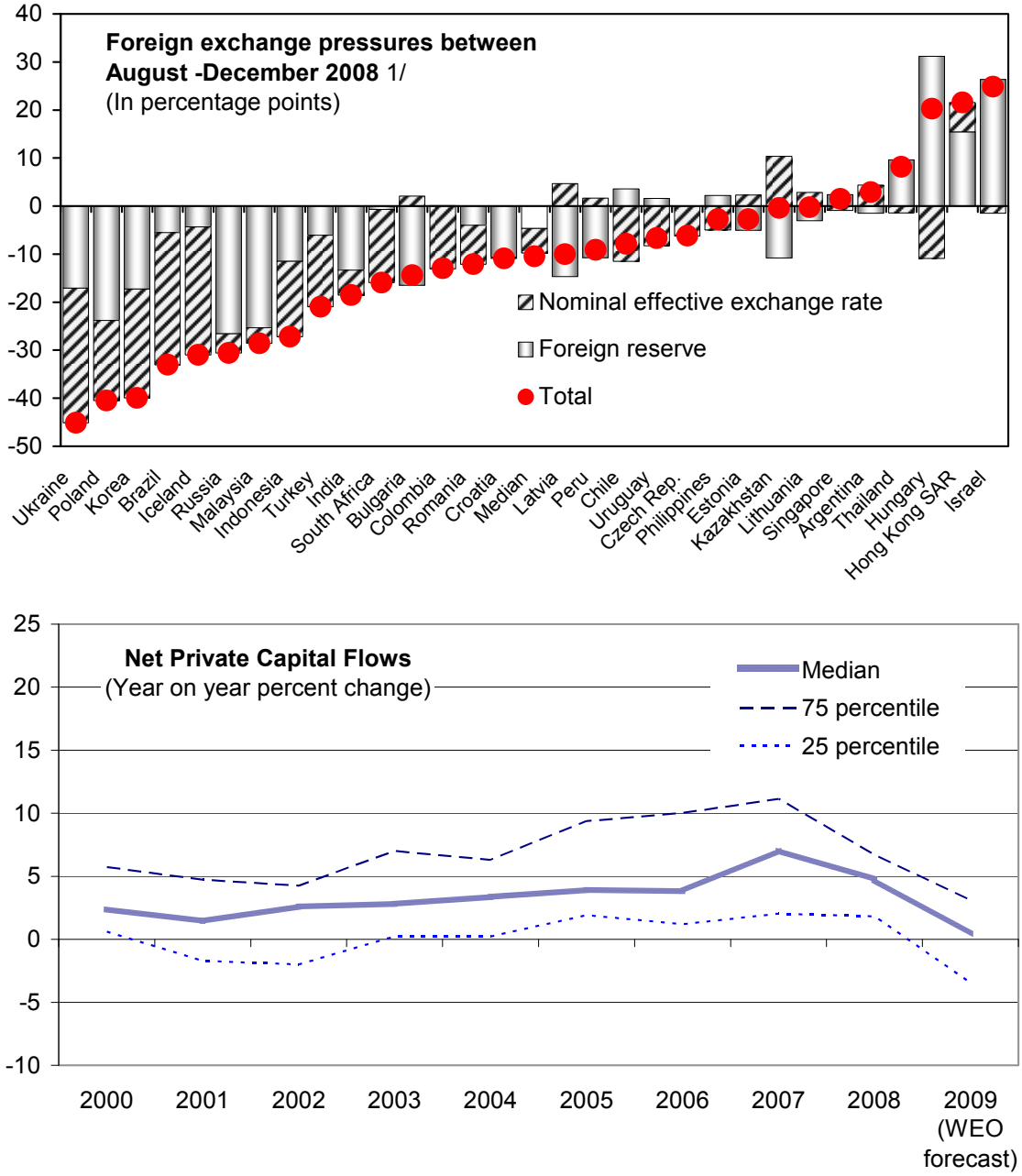
(In basis points)





Sources: Bloomberg and the authors' estimates.

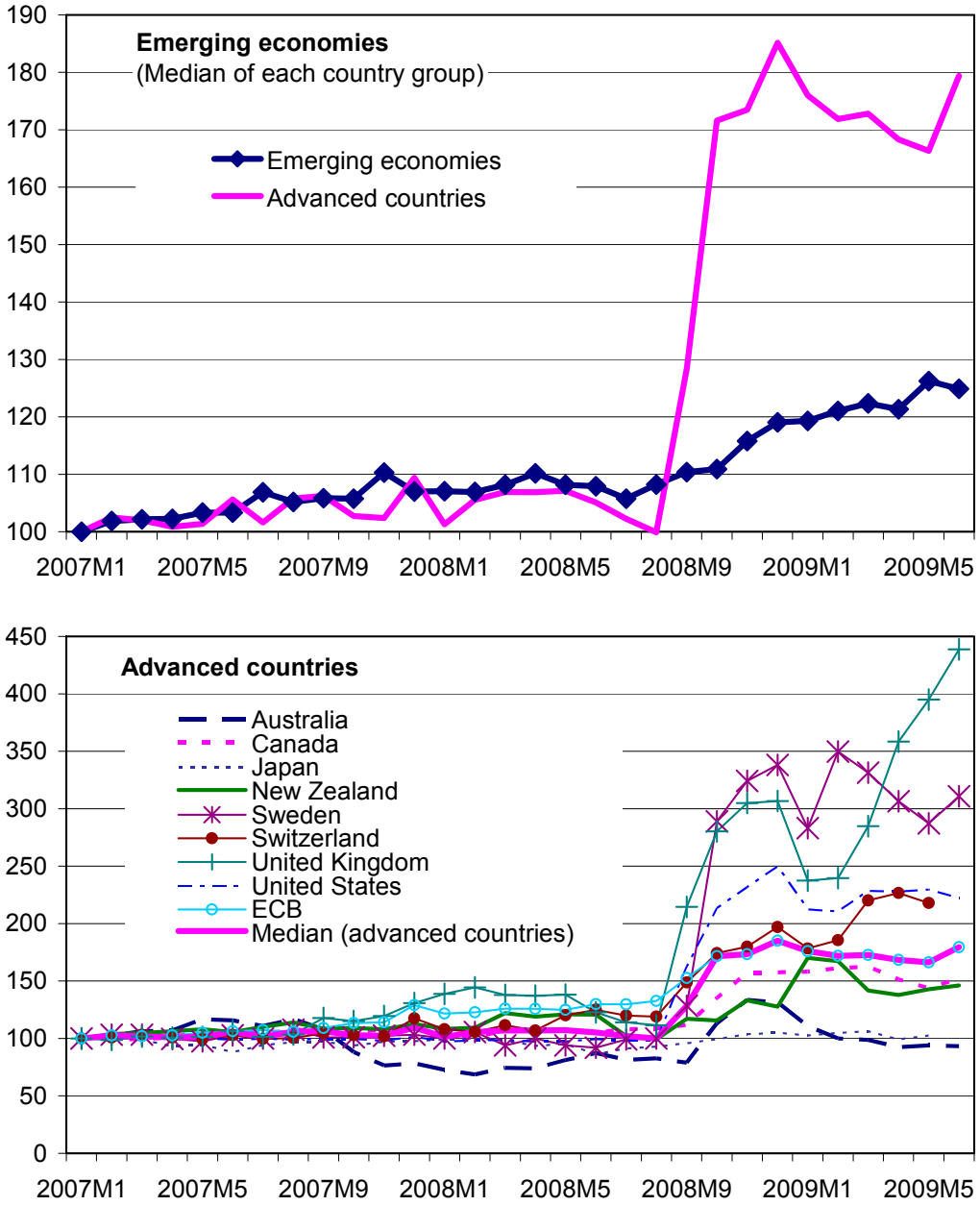
Figure 5. Emerging Economies: Foreign Exchange Pressures and Net Private Capital Flows



Sources: IMF Information Notice System and World Economic Outlook database; and the authors calculation.
1/ Calculated as a change in foreign exchange reserve + a change in nominal effective exchange rate.
2/ 1/ The sample includes all countries in Table 2.

Figure 6. Central Bank Assets at Constant Price, January 2007–June 2009 1/

(January 2007 = 100)

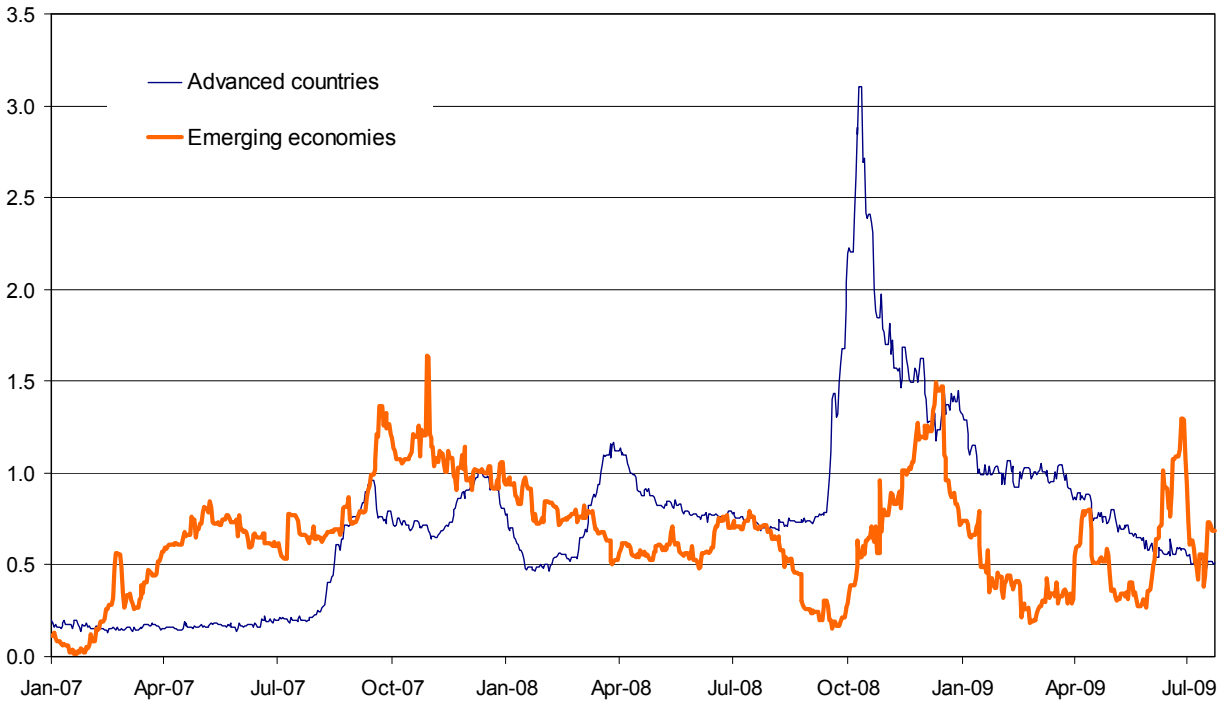


Sources: IMF International Financial Statistics; Haver; CEIC Database; and the authors' calculation.

1/ Nominal values of central bank assets are deflated by CPI. Emerging economies include all countries listed in Table 2, excluding Iceland and Pakistan. Advanced countries are those listed in the bottom figure.

Figure 7. TED Spreads

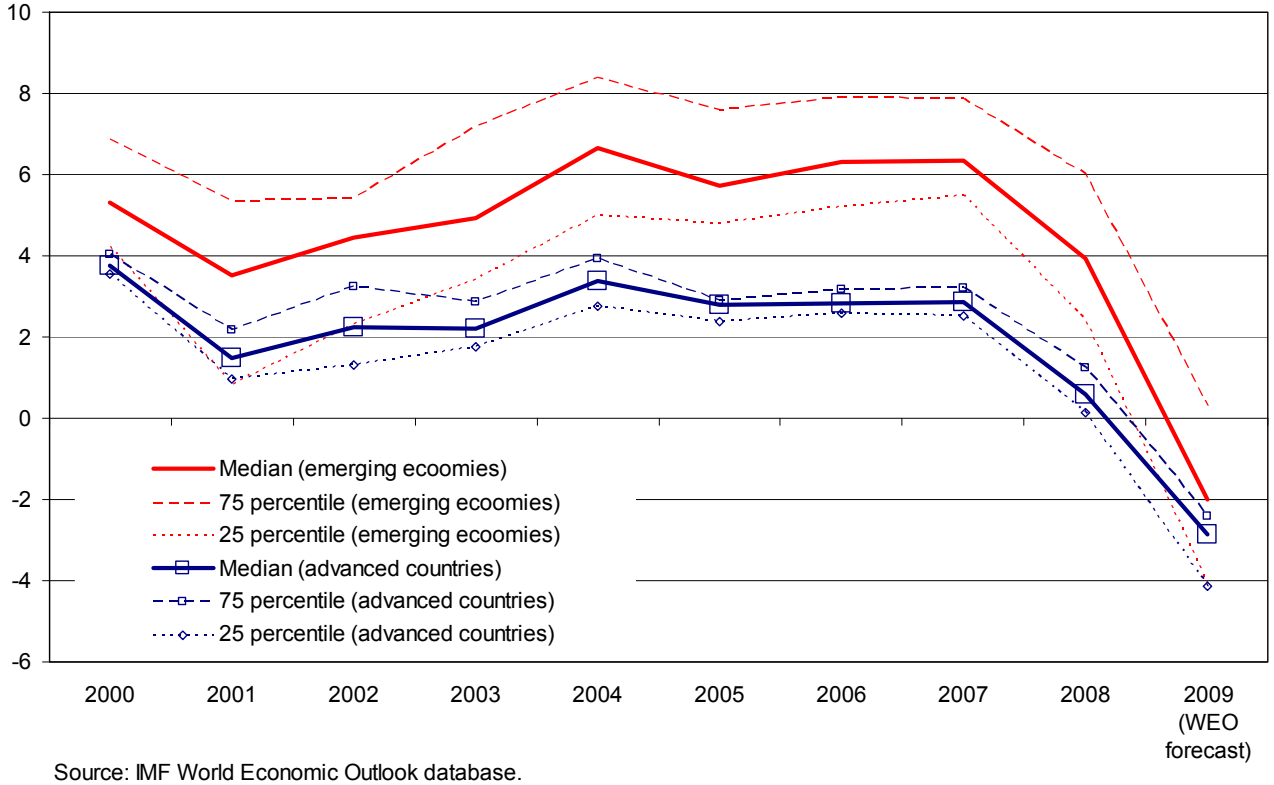
(In percent)



Source: Datastream.
1/ The sample countries include for advanced countries, Canada, Euro area, Norway, Sweden, and United Kingdom, and for emerging economies, Brazil, China, Czech Republic, Egypt, Hungary, Israel, Latvia, Malaysia, Singapore, South Africa, Thailand, and Turkey.

Figure 8. Real GDP Growth

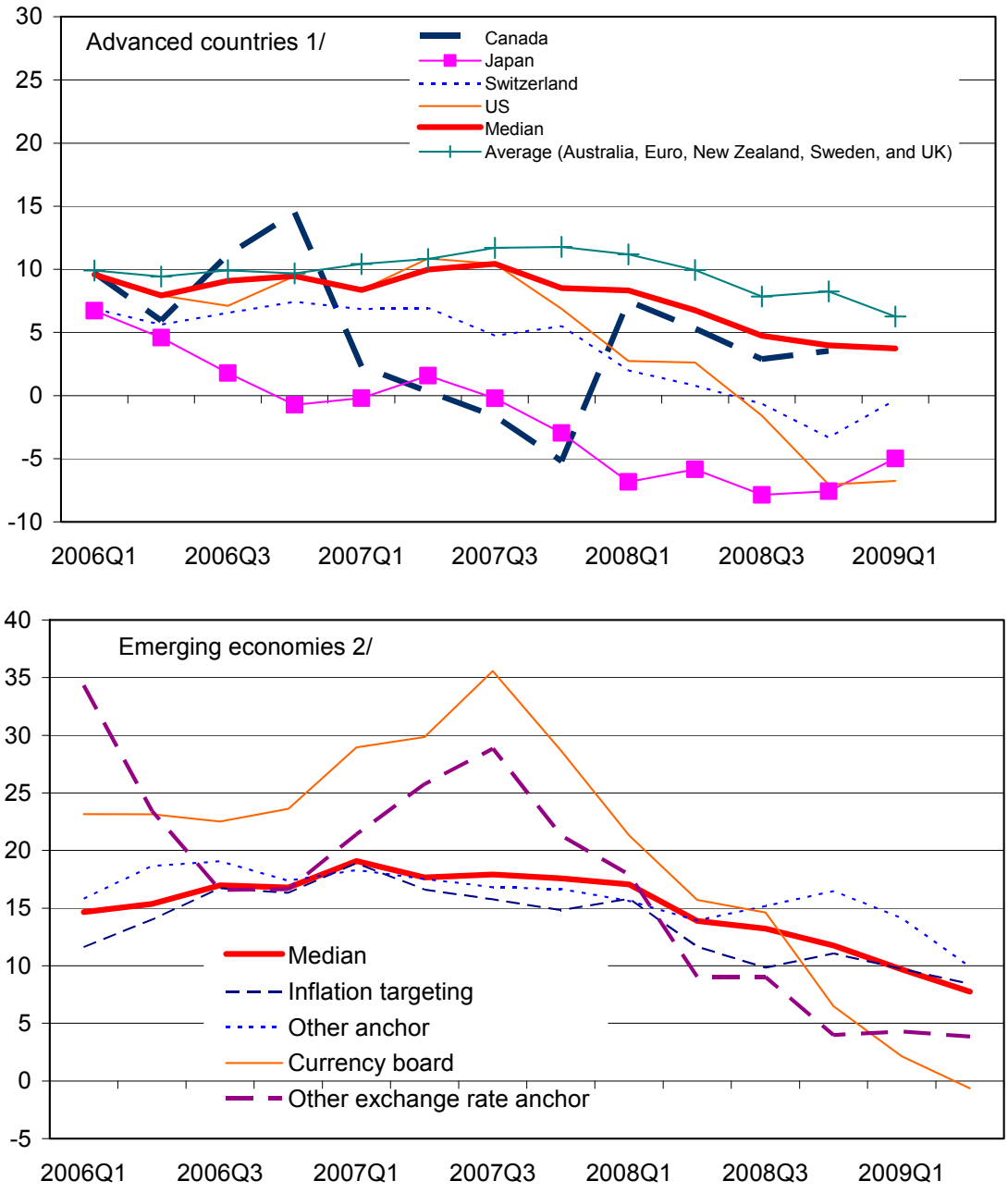
(In percent)



Source: IMF World Economic Outlook database.
1/ The sample includes all countries in Table 2. The data for 2009 are those of April 2009 WEO forecast.

Figure 9. Growth of Real Credit to the Private Sector

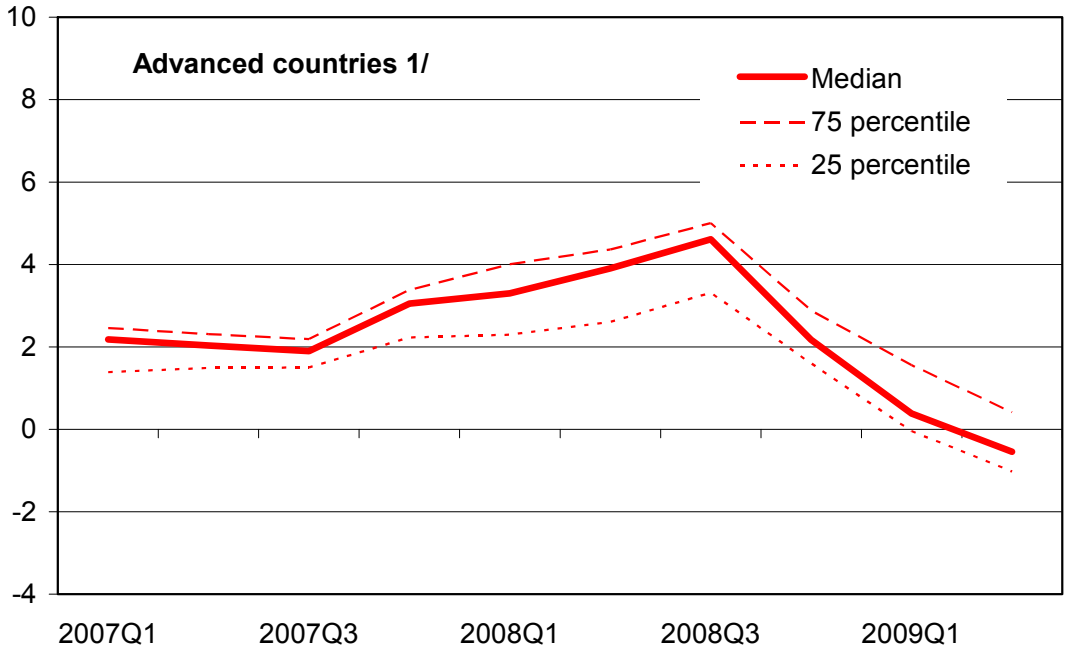
(In percent)

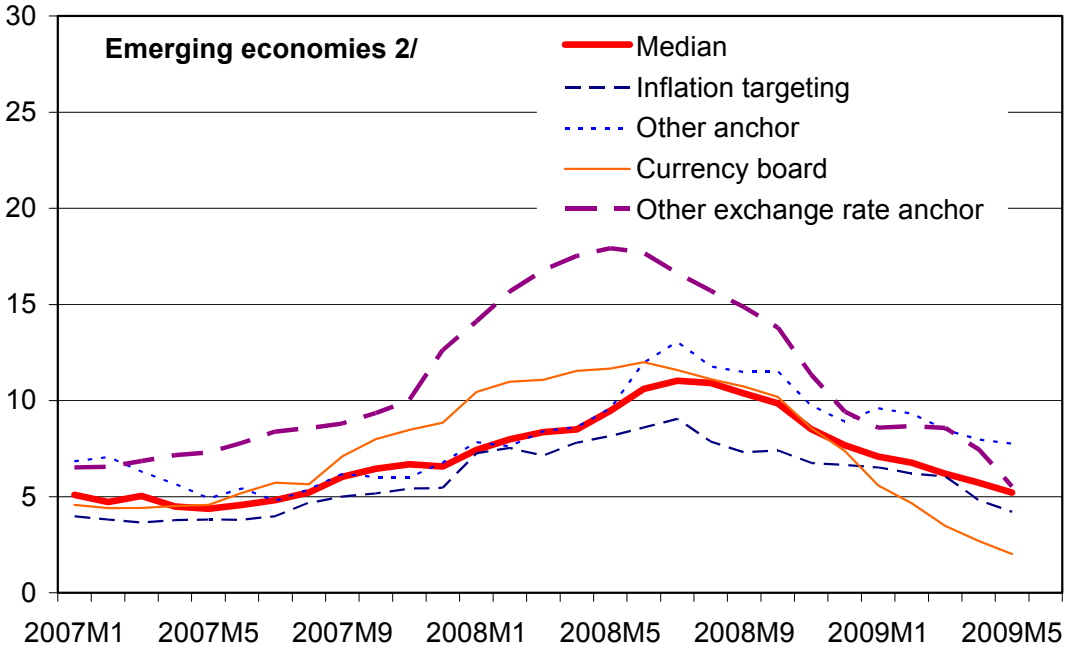


Source: IMF International Financial Statistics and Haver.
1/ Median is for all countries in the sample. Inflation in Australia, Euro area, New Zealand, Sweden, and United Kingdom did not fall below zero during the sample period.
2/ The sample includes all countries in Table 2 except Iceland.

Figure 10. Inflation

(In percent)

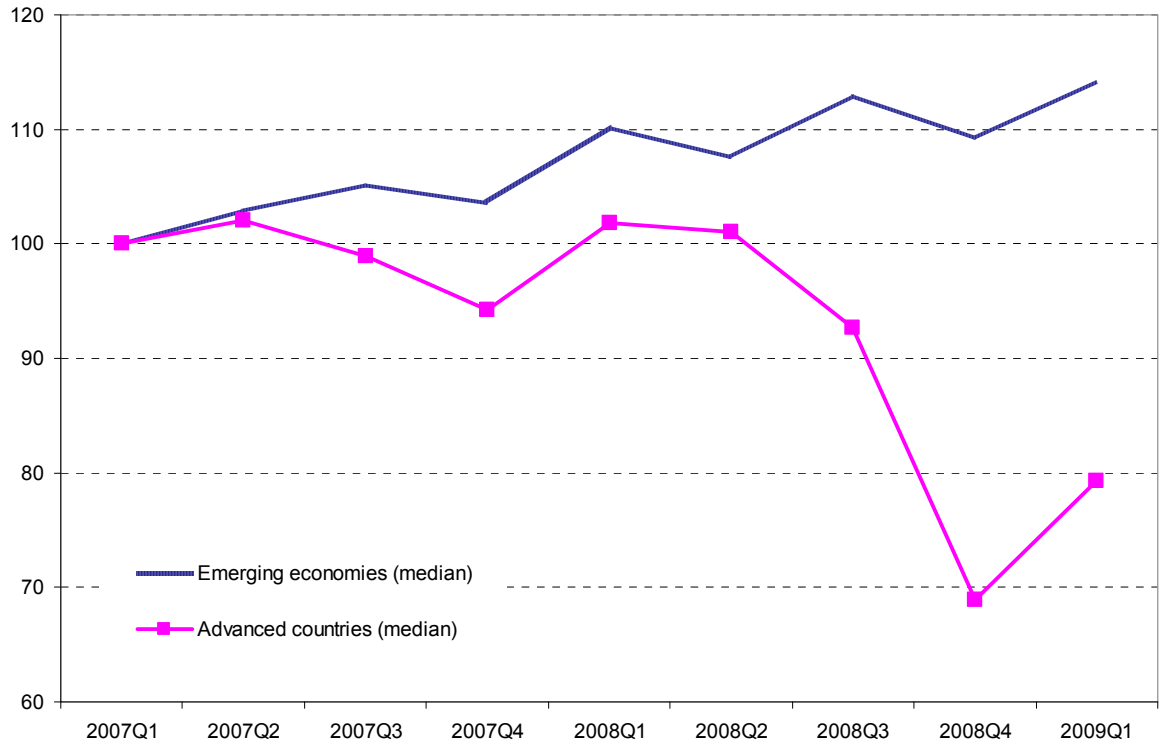




Source: IMF International Financial Statistics and Haver.
1/ The sample countries are Australia, Canada, Japan, New Zealand, Sweden, Switzerland, United Kingdom, and United States.
2/ The sample includes all countries in Table 2.

Figure 11. The Ratio of Credit to the Private Sector to Reserve Money, Q1 2006–Q1 2009

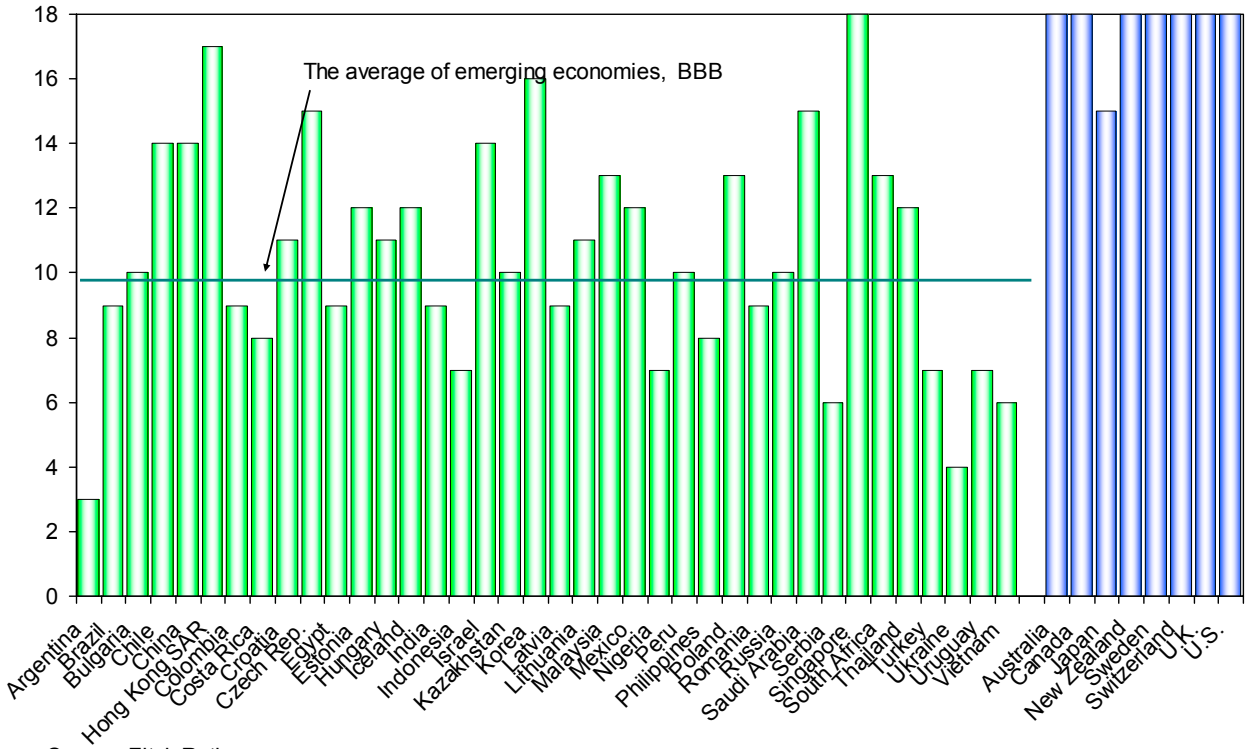
(2007 Q1=100)



Source: IMF International Financial Statistics.

Figure 12. Long-term Local Currency Ratings

(As of August 19, 2009) 1/



Source: Fitch Ratings

1/ 19-scale Fitch ratings (AAA, AA+, AA,.....CCC) are mapped one-on-one to numerical numbers (18, 17, 16, ….0).

Annex 1. Central Bank Conventional Measures

The framework for conventional measures can be defined by policy objectives and the measures to implement these objectives. Many modern central banks are held accountable by adhering to stated objectives, typically (i) maintaining price stability, (ii) smoothing output without prejudice to price stability, and (iii) contributing to financial stability. The policy objectives, together with the economic, market, conjunctural and other circumstances, naturally give rise to the implementing measures employed by central banks.

Central Bank Policy Objectives

Price stability is generally accepted as the primary macroeconomic objective of a central bank because low and stable inflation is supportive of real growth in the long run (Fischer, 1995, and Lybek and Mason, 2005). *Price stability* policies are organized around a nominal anchor, such as an inflation target, soft or hard exchange rate peg, or money target, although many central banks do not adhere to a single nominal anchor (Stone and Bhundia, 2004). *Output smoothing* consistent with the price stability objective is also an important macroeconomic objective depending on the nominal anchor, economic shocks, and other circumstances. The most popular interest rate reaction function—the Taylor rule—posits that central banks respond to both inflation and output.

Liquidity stability has traditionally been seen as the main central bank financial stability objective. Financial stability means that the financial sector is supporting rather than impeding economic growth. In addition, financial stability is an important prerequisite for the effective conduct of monetary policy. In many countries, both the central bank and the government have financial stability responsibilities, with the central bank responsible for bank regulation and supervision. Even without an explicit mandate for financial stability, most central banks are expected to serve as the lender of last resort (LOLR) and responsible for the *provision of liquidity,* based on their monopoly control over bank reserves. The government is generally in charge of financial sector legislation and solvency. The distinction between liquidity LOLR support and solvency support is important because the injection of bank capital by the public sector ultimately requires fiscal resources, which can be raised only by the government.

Conventional Measures

Central banks attempt to achieve macroeconomic objectives with the use of both market and nonmarket based measures. In normal circumstances, central banks that adhere to an inflation target anchor typically utilize *domestic open market operations* and/or *standing credit and deposit facilities* to steer their policy interest rates. To this end, central banks also undertake liquidity management—short-term domestic currency interventions to counter shocks in the money market to smooth high frequency movements in interest rates. Exchange rate anchor

central banks employ *open market foreign exchange operations*, together with interest rate policy, to maintain an exchange rate peg. In practice, the distinction between an inflation target anchor and an exchange rate anchor sometimes becomes blurred in small open emerging economies, as emerging economy inflation target countries commonly use open market foreign exchange intervention to smooth foreign exchange shocks (Stone and others, 2009). The use of *direct instruments* (e.g., reserve requirements and direct credit control) to implement changes in the monetary policy stance is fairly conventional in many emerging economies, particularly where domestic financial markets are shallow (Baliño and others, 1995).

Central bank tools used to maintain financial stability are focused on liquidity provision. Traditionally, central banks are seen as responsible for the *narrow provision of LOLR domestic liquidity.* LOLR is usually provided to individual institutions. However, a few observers also include "markets" as recipients of LOLR.