Impact of the crisis on local money and debt markets in emerging market economies

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I. Financial crisis and panic in global financial markets

Starting in the second half of 2007, increased risk aversion and perceptions of counterparty risk led to disruptions in financing in developed money markets that spilled over to foreign exchange (FX) markets, as seen in widening Libor–OIS spreads and spreads between the FX swap-implied dollar rate and dollar Libor, with the latter reaching 40 basis points (bp) in September 2007, indicating large and persistent deviation from covered interest parity (CIP) (see Baba and Packer (2009a, 2009b)).[2] The effects on emerging market economies (EMEs) were relatively limited until the failure of Lehman Brothers in September 2008. In the third and fourth quarters of 2007, and then around the first and second quarters of 2008, only two central banks responding to the questionnaire circulated for the BIS meeting reported sustained periods of stress in their FX markets. Two others reported stress, but only for a very brief period. Over these periods, there were distinct and persistent (but relatively limited) increases in the MOVE index, suggesting higher perceived risks in developed debt markets, as well as in (EME sovereign) CDX spreads, suggesting higher perceived EME sovereign default risks, and also in the Libor–OIS spreads, reflecting disruptions to FX cash markets. The effects of tighter financing conditions on EMEs at the time were most apparent in equity price declines.

The impact on EMEs was much greater following the failure of Lehman Brothers on 15 September 2008. In response to deleveraging, there were large capital inflow reversals, notably in cross-border bank lending. International debt markets for emerging market issuers closed and trading collapsed, irrespective of the credit quality of borrowers (BIS (2009)). The number of EMEs reporting financial stress increased sharply, jumping from four to 10 (ie almost two thirds of the central bank questionnaire respondents) in the space of a week. However, reported stress episodes had declined significantly by the end of 2008 and declined further after rebounding around February–March 2009. They had fallen to zero by the third quarter of 2009. The rise and fall in the number of reported stress episodes was broadly correlated with the fairly sharp rise and fall in the MOVE index and the Libor–OIS and (EME sovereign) CDX spreads, suggesting that external factors played a large role in explaining stress episodes.[3] However, the rise in CDX spreads was more persistent than in the other series; they jumped to around 1,000 bp in late September 2008, then hovered around 700–900 bp until the end of the first quarter of 2009, before declining to about 400 bp in the second quarter of 2009 and to about 250 bp towards the end of 2009. This was around 100 bp higher than in 2007, but similar to the level seen in the first part of 2008. It may be

[1] BIS. Research assistance by Pablo Garcia-Luna and Agne Subelyte is gratefully acknowledged.

[2] On 12 December 2007, the Federal Reserve, the European Central Bank, the Bank of Japan, the Bank of England and the Swiss National Bank announced coordinated measures designed to address pressures in short-term funding markets, including the establishment of US dollar swap lines (BIS (2009)).

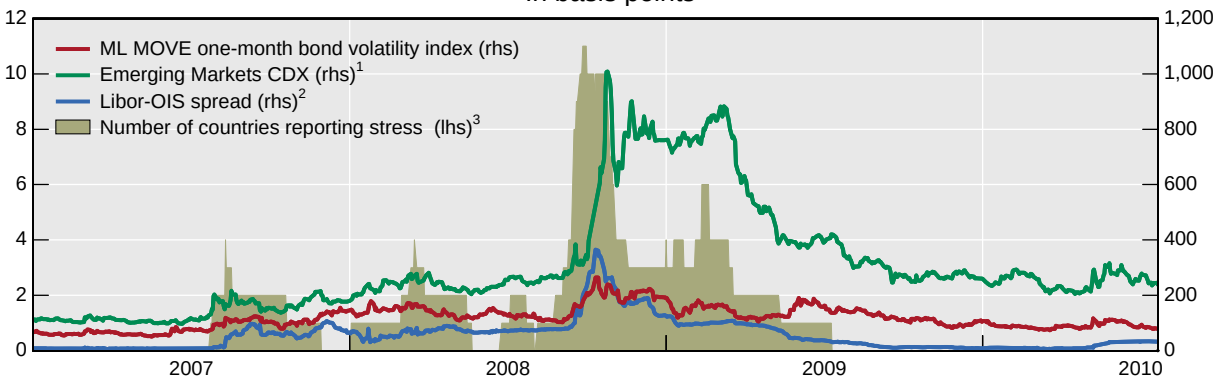
[3] This interpretation is broadly consistent with the evidence on the importance of credit supply factors in explaining the reversal of cross-border financing to EMEs presented in the paper by Takats ((2010), this volume).

noted that the number of countries reporting stress in late 2008 fell, even though the CDX spreads remained high, suggesting resilience to stress in international debt markets.

Graph 1

Stress episodes and credit spreads

In basis points



[1] Five-year on-the-run credit default swap (CDS) mid-spread on index contracts of investment grade and below investment grade. [2] Three-month US dollar Libor minus overnight index swap (OIS) rates, in basis points. [3] The countries in the sample are Argentina, Brazil, Chile, Colombia, the Czech Republic, Hong Kong SAR, Hungary, India, Korea, Malaysia, Mexico, Peru, Poland, Saudi Arabia, Singapore and Turkey.

Sources: Bloomberg; Datastream; JPMorgan Chase; BIS calculations.

The policy responses of central banks in developed market economies helped lower the stress indicators reported in Graph 1. First, large central bank funding and financial rescue efforts, including the unlimited provision of dollars in Federal Reserve swap lines[4] with developed central banks (and unprecedented swap lines of US$ 30 billion each with four EME central banks) helped stabilise global funding markets. Second, as market sentiment stabilised, the reduction in policy rates in developed market economies towards zero (in the United States, interest rates fell from 5.25% in September 2007 to 2% by April 2008 and to 0.25% in December 2008) increased the attractiveness of emerging market assets, eventually contributing to improvements in financing conditions and a resumption in capital flows.

The effects of the shock affected asset prices across several markets. Sovereign bond spreads for EMEs jumped across the board to levels not seen since past emerging market crisis episodes. EME equity and domestic sovereign bond markets declined sharply (BIS (2009)). Exchange rates depreciated in many countries, although in some cases, heavy FX market intervention dampened exchange rate adjustment. In some countries, funding pressures also arose in domestic money markets.

Central bank contributions in this volume point to the sudden change in conditions in financial markets in EMEs following the collapse of Lehman Brothers, with some arguing that the financial crisis effectively erupted in EMEs after the bankruptcy of Lehman Brothers. Mesquita and Toros (2010) emphasise the foreign-driven dollar liquidity squeeze that affected the financial markets in Brazil. Fung and Yu (2010) also observe that, after the

[4] On 12 December 2007, the Federal Reserve Board of the United States, the European Central Bank, the Bank of Japan, the Bank of England and the Swiss National Bank announced coordinated measures designed to address pressures in short-term funding markets, including the establishment of US dollar swap lines (BIS (2009)). Starting in mid-October 2008, Federal Reserve swap facilities with these central banks were unlimited.

bankruptcy of Lehman Brothers, developments in financial markets took a dramatic turn and international money markets were the main channel of spillover for the shock. The Hong Kong SAR money market became a source of funding for international banks, but there were no disruptions in that market. In its paper for this meeting, the Czech National Bank observes that financial and FX markets were affected in a permanent manner after the bankruptcy of Lehman Brothers. Al-Hamidy (2010) suggests that the collapse of Lehman Brothers made international banks reluctant to fund even the strongest emerging market banks due to their own need to build up liquid assets.

II. Foreign exchange markets

The turbulence following the failure of Lehman Brothers created strong depreciation pressures on EME currencies as dollar funding conditions tightened globally and resulted in a sudden stop in capital inflows to EMEs.[5] The effects are illustrated in Graph 1 of the Supplementary Graphs and Tables circulated for this meeting and in Table 1 of this paper.

As summarised in Table 1 (columns 1 and 2), the bankruptcy of Lehman Brothers was associated with sharp depreciations in spot exchange rates and increases in exchange rate volatility. The cumulative median depreciation over the period 1 September 2008–31 March 2009 was 22.5%. This was partly reversed starting around April 2009 (column 3). With regard to forward rates, notwithstanding the sharp depreciations in the spot markets, there was a general tendency for forward premia to rise or for forward discounts to switch to forward premia (Table 1 and Annex, Graph A1), indicating a desire to insure against possible further depreciation.

Cross-country variation

There was significant cross-country variation in spot and forward rate behaviour. Turning first to the countries whose exchange rate depreciation was below the median in Table 1, in some cases there was limited (eg the Philippines, Singapore, Thailand) or no (eg China, Hong Kong SAR, Saudi Arabia) *spot exchange rate* depreciation. The impact of the crisis on forward rates was also limited, although in some cases it was more visible than the impact on the spot rate. For example, in China, the (non-deliverable offshore) forward rate exhibited some volatility, switching from a discount to a premium in the third quarter of 2008. Volatility persisted until the second quarter of 2009, although it was moderate in comparison with other countries. There was also some volatility in the forward rate in Malaysia, with the forward discount increasing briefly, before switching to a premium. Forward rates were otherwise stable in the countries in this group, with most countries reporting no stress episodes in their FX markets in the aftermath of the collapse of Lehman Brothers (eg China, Hong Kong SAR, Saudi Arabia, Thailand), while those countries reporting stress episodes stated that such episodes were very brief (Malaysia and Singapore). In countries with exchange rate depreciations above the median, exchange rate movements were in some cases very large, ranging from 38% to 56% in Brazil, Hungary, Mexico, Poland, Russia and Turkey.

It might be noted that there is no clear pattern relating the degree of exchange rate depreciation to the forward premium. If expectations stabilise in response to exchange rate

[5] Corporates (financial and non-financial) and (to a lesser extent) governments that had outstanding external debt found that the value of their liabilities increased sharply. While many EMEs have become net creditors (ie Brazil, China), sectoral balance sheets were still exposed to foreign creditors in several EMEs.

adjustment, we would expect forward premia to fall as the exchange rates depreciate, but this is not apparent in the data.

Table 1

Exchange rates

	Spot rate[1]			Forward premium[2]		
	1 Aug 07–31 Aug 08	1 Sep 08–31 Mar 09	1 Apr 09–31 Dec 09	1 Aug 07–31 Aug 08	1 Sep 08–31 Mar 09	1 Apr 09–31 Dec 09
Emerging Asia						
China	–9.8	0.0	–0.1	–1.8	1.0	–0.1
Hong Kong SAR	–0.2	–0.7	0.1	–0.2	–0.1	–0.1
India	8.3	16.4	–8.4	0.6	0.8	0.7
Indonesia	–0.4	26.5	–18.8	1.0	2.3	1.8
Korea	17.2	27.3	–15.2	–0.0	–0.4	–0.2
Malaysia	–1.9	7.6	–6.1	–0.1	–0.0	0.3
Philippines	0.2	6.0	–4.3	0.6	0.7	0.9
Singapore	–6.3	7.3	–7.6	–0.5	–0.1	0.0
Thailand	1.4	4.0	–6.1	–0.1	0.8	0.2
Latin America						
Argentina	–2.9	22.6	2.2	1.8	12.9	4.2
Brazil	–13.0	41.7	–24.8	1.6	2.8	1.9
Chile	–1.3	12.7	–13.0	0.4	1.1	–0.4
Colombia	–3.2	34.2	–20.2	1.6	1.9	1.0
Mexico	–5.9	38.1	–8.0	1.0	1.9	1.2
Peru	–6.5	6.8	–8.5	–0.5	1.2	0.3
Other emerging markets						
Czech Republic	–17.9	22.5	–10.7	–0.0	0.1	0.3
Hungary	–11.5	44.0	–19.3	1.0	1.7	1.6
Israel	–16.6	16.6	–9.9	0.1	0.3	–0.1
Poland	–17.9	56.1	–19.5	0.4	0.7	0.5
Russia	–3.9	38.6	–13.0	0.4	7.0	2.1
Saudi Arabia	–0.0	0.0	0.0	–0.3	0.1	–0.0
South Africa	7.9	25.5	–23.4	1.9	2.2	1.6
Turkey	–9.1	42.8	–10.8	3.7	4.0	2.3
Median for all EMEs in table	–3.2	22.5	–9.9	0.4	1.0	0.5

[1] A negative sign indicates an appreciation of the local currency; period changes, in per cent. [2] Premium (or discount) resulting from a forward contract to be executed in the future at a forward rate. The premium is calculated as follows: ((forward rate – spot rate) / spot rate) * 100. The resulting value is a percentage and termed a premium if it is positive. If the resulting percentage is negative, it is a forward discount; period averages.

Sources: Bloomberg; CEIC; Datastream; national data.

Discussion

While the primary trigger was external, depreciation pressures in each EME reflected the varying influence of a number of factors.[6] The following explanations may be offered for the differences in exchange rate volatility.

First, the *differences in monetary frameworks and exchange rate regimes*. Spot exchange rate volatility was lower in several EMEs where currencies were more closely linked (at least

[6] For example, in its questionnaire response, the Bank of Mexico explains that the stress period observed at the time in the FX market was due to a combination of increased risk aversion, reduced liquidity (fewer participants) and cutbacks in leverage.

de facto) to the US dollar or other international currencies. All the countries showing greater exchange rate volatility are inflation targeting regimes with floating rates. As noted in Moreno ((2010), this volume), many of those countries provided a great deal of foreign currency support to FX markets but (as intended) not to the extent of preventing exchange rate adjustment. In contrast, in other countries, exchange rate volatility was not much higher before and after the collapse of Lehman Brothers.

Second, *country-specific factors*, including:

- *Greater financial integration*. In some countries, foreign investors sought funding in EME local currency markets. One element was foreign investors closing their positions in domestic markets to acquire foreign currency. For example, market commentary suggests that, in Mexico, the forward market turned into the main source of foreign exchange as the supply from the FX swap market dried up at the end of the third quarter of 2008. Prior to the failure of Lehman Brothers, tighter financing conditions appear to have prompted foreign investor withdrawal from EME equity markets. Another element was exposure to cross-border bank financing; EMEs with a greater reliance on such financing were more vulnerable to the reversals in cross-border lending, which started in the third quarter of 2008. Still another element was the onshore presence of foreign banks – while this generally appeared to be a stabilising factor, in some cases, foreign bank subsidiaries appear to have supplied financing to their parents. In its contribution for this meeting, the Hong Kong Monetary Authority suggests that domestic money markets became funding markets for international banks with a large onshore presence (see also the discussion in Takats ((2010), this volume)).
- *Use of derivatives to take positions in FX markets*. In some countries (eg Brazil, Korea, Mexico and Poland) firms engaged in derivatives transactions that implied delivery of foreign currency when the currency depreciated past a certain threshold; this appears to have contributed to depreciation pressures. For example, in the Banco de Mexico's contribution for this meeting, Sidaoui, Cuadra and Ramos-Francia (2009) observe that FX derivatives might have played a destabilising role in the Mexican peso market.
- *Differences in foreign reserve levels*: some recent research (Obstfeld, Shambaugh and Taylor (2009)) suggests that countries with lower ratios of foreign reserves to M2 experienced sharper depreciation pressures than other countries (see the discussion in Moreno ((2010), this volume)).

To what extent was exchange rate volatility a concern? A number of points may be highlighted.

First, the fact that there was little or no exchange rate volatility does not mean that there was no pressure in FX markets. For example, in Hong Kong SAR and Saudi Arabia, which maintain pegs to the US dollar, the currencies hit the upper bound of the band and foreign currency sales took place.

Second, some of the exchange rate adjustment reflected real as well as financial factors, and was not necessarily (directly) related to the spillover from the crisis. For example, commodity-exporting countries experienced depreciations as a result of declines in commodity prices. In South Africa, the South African Reserve Bank (SARB) reports that the fluctuations in the spot exchange rate were related to movements in the currencies of developed economies and were not due to the direct impact of the global crisis on South African financial markets.

Third, the extent to which exchange rate volatility raised concerns appears to have varied across countries. In some cases, efforts were made to dampen exchange rate volatility, and there was significant concern about the possibility of downward spirals. This may account for the significant decline in foreign reserves in some countries. In other countries, particularly those with high inflation, exchange rate depreciation pressures may have made monetary

authorities more reluctant to ease (see the discussion in Moreno ((2010), this volume)). In particular, even if the pass-through of exchange rates to inflation is usually low, under unsettled market conditions it could possibly be higher.

The FX swap market

The development of the FX swap market appears to have played a crucial role in the transmission of shock to FX markets in global financial markets. But dislocations in the FX swap market[7] also spilled over to a number of EMEs. For example, in the Czech Republic, the Czech National Bank reports that liquidity in the FX spot and outright forward markets fell sharply in the winter of 2008, at the same time as the operation of domestic money markets was impaired.

The FX swap market is a channel of transmission between the financial markets in EMEs and global interbank markets. Saxena and Villar (2008) show that the FX swap market is an important source of funding in many EMEs. Hong Kong SAR, Hungary, Mexico, Poland, Singapore and South Africa account for the largest share of the FX swap market in EMEs. These countries host foreign bank subsidiaries or branches that might face more limited access to local funding. Most of their operations in domestic capital markets are funded through the FX swap market. Foreign currency funds grant access to local funds without having FX converted in the spot market and taking the exchange rate exposure. Other foreign investors with investment activities in emerging financial markets also make extensive use of the FX swap market for hedging purposes (Baba and Packer (2009)). In the case of foreign bank subsidiaries, these liabilities are very short-term and cross-border. If international banks were to stop rolling them over they would subject the EME banking sectors and financial markets to severe stress. Likewise, EMEs with large and liquid FX swap markets could experience stress if financial pressures developed in global financial markets (as in the case cited above of foreign banks funding themselves in Hong Kong SAR).

The FX swap market involves simultaneous spot and forward FX transactions. Investors in EMEs can sell foreign currency (usually dollars) at the spot FX rate in exchange for local currency and simultaneously purchase foreign exchange at the forward rate. A number of financial considerations arise from these transactions. First, changes in the exchange rate over the period alter the price of the FX swap contract. If the foreign exchange depreciates, the price of the FX swap increases. It is clear that, if the FX swap were used to hedge the holding of local currency domestic investment (ie local currency bonds) the investment would be partly protected against the FX depreciation owing to the increase in the price of the swap contract.

Second, an FX swap is subject to considerable counterparty risk. In particular, the seller of the foreign exchange in the spot market is open to the risk of the counterparty defaulting on the delivery of the FX forward. The credit risk-mitigating mechanisms embedded in the contract (ie cash collateral) are subject to considerable FX risk. This is particularly the case during periods of stress, when the exchange rate depreciates in EMEs and the value of collateral falls. The party on the receiving side of the foreign currency at a later date might like to demand additional collateral to secure the delivery of the foreign exchange. The hedging purpose of the contract has encouraged comparisons with the interest rate swap. Baba and Packer (2009) explain that this last contract is less subject to counterparty risk.[8]

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[7] This paper uses a relatively broad definition of FX swap. It includes derivatives contracts where the counterparties agree to exchange foreign exchange in a jurisdiction as well as the synthetic financial instrument that is built around the purchase/sale of spot and forward or futures of foreign exchange. It could also encompass onshore or offshore contracts involving an emerging market currency.

[8] The paper refers to Duffie and Huang (1998).

The intuition here is that the interest rate swap implies an exchange of notional amounts but the FX swap implies an open position on the contracted amount to the extent that the value of the collateral might be altered with the depreciation of the currency or the increase in counterparty risk.

Third, as an FX swap contract involves transactions in different currencies, country risk may be even more relevant than counterparty risk. This is because the contract is subject to differences in sovereign risk between the jurisdictions (the risk of default of the sovereign in the country of each of the contracting parties) and the possibility of the governments altering the payout through their actions (eg capital controls).

The cost of funds obtained in an FX swap contract is apparent in the following expression:

$$\frac{S_t(1+i_t)}{F_{t,t+k}} \geq 1+i_t^* \qquad [1]$$

where S_t is the spot FX rate (expressed as the amount of domestic currency per unit of foreign currency), F_{t+k} is the forward exchange rate k periods ahead and i_t is the money market (riskless) interest rate and i_t^* is the foreign interest rate relevant for the period k. This condition indicates that demand and supply conditions in the FX swap market in EMEs will adjust to reflect differences between domestic and foreign interest rates.

The left-hand side of expression [1] shows the financing cost in foreign currency in a national jurisdiction. It reflects the FX swap-implied foreign currency interest rate, which is often not directly observable in many jurisdictions. The implied ("onshore") foreign currency interest rate can be computed from spot and forward FX rates and the relevant money market rate. If covered interest parity holds, the FX swap-implied foreign currency rate would equal the foreign interest rate in international markets (eg Libor). Indeed, during periods of tranquillity, spreads between the two have been small. However, during the crisis, disruptions in FX swap markets caused large divergence between FX swap-implied rates and Libor rates, which could be attributed to different sources of risk. One source was difficulties in securing dollar financing in a specific market, which affected non-dollar developed financial markets (see Baba and Packer (2009)). However, EMEs also appear to have been affected by perceptions of other risks (eg financial, economic, political, etc) and possibly also illiquidity in some markets, leading to particularly high spreads in some cases.

In September 2008, as FX swap prices increased in several jurisdictions, the spread between FX swap-implied dollar interest rates and Libor widened.[9] The global surge in demand for the dollar raised implied interest rates in Chile, the Czech Republic, India, Hong Kong SAR, Korea and Turkey (Annex, Graph A1). For example, in India and Korea, the FX swap-implied spreads exceeded 1,000 bp; in Chile and Turkey, the spread hovered at around 500–600 bp (see Central Bank of Chile (2009)); and in the Czech Republic and Hong Kong SAR, the spread peaked at around 300 bp.

One case of interest is Mexico, where the calculations result in a (counterintuitive) fall in the onshore dollar-implied rate in domestic financial markets. One plausible explanation is that the forward premia had turned negative either because of an increase in the supply of US dollars in the forward market or because of a drop in demand. Market commentary at the time suggested that demand for dollars in the forward market fell sharply in Mexico during

[9] As noted above, the Libor-OIS spread widened up to 250 bp in September 2008.

the period.[10] Alternatively, the supply of foreign exchange in the forward market could have increased sharply, feeding the demand for foreign exchange in the spot market.

Another case of interest is that of Hungary (see Mák and Páles (2009)). The problems in the international money markets brought disorder to the FX swap market in September 2008, quickly spreading to the banking sector. Foreign currency liquidity collapsed along with a sharp reduction in the supply of foreign currency (especially US dollars) and a rise in counterparty risk in the domestic banking sector. The implied yield in foreign currency on newly concluded transactions in the FX swap market increased significantly in September and October. Mák and Páles (2009) argue that the rise in the FX swap-implied yield, combined with a market structure where some banks (international ones) had access to foreign currency funding while others (locally owned banks) did not, led to disorderly market dynamics. The forward premium provided evidence of the sharp rise in the cost of foreign currency borrowing observed in October 2008. When foreign-owned banks managed to roll over transactions with their headquarters, the FX swap market risks to financial stability receded.

III. Interbank and government debt markets

Domestic financial markets reacted in a very disparate manner during the financial crisis. The changes observed in interest rates and asset prices varied across EMEs. Two facts stand out from the questionnaire responses and central bank contributions for this meeting. First, several contributions report the absence of any disruption in interbank overnight and money markets, or even in other large domestic markets, such as the government bond market. However, in the case of others, the effects of the financial shock on domestic markets were quite severe. Second, the episodes of financial stress in interbank and money markets were fewer in number and shorter in duration than those reported in FX markets (see the shaded areas in the Annex Graphs A1 and A2).

The central bank contributions to this meeting give accounts of some stress episodes. Al-Hamidy (2010) reports that offered rates in Saudi Arabia rose more than 200 bp over the reverse repo rate in the aftermath of the collapse of Lehman Brothers. Mesquita and Toros (2010) note that smaller Brazilian banking institutions were vulnerable to a domestic liquidity shock. Local banks were funded in local wholesale money markets rather than by retail deposits, which turned out to be a source of financial vulnerability that propagated the crisis and affected the economy. From a broader financial market perspective, Mesquita and Toros (2010) also report that FX (and equity price) volatility led to a substantial increase in margin requirements in the organised exchange (the São Paulo Mercantile and Futures Exchange (BMF) and the Brazilian stock index (Bovespa)). The increase in margin requirements and corresponding tighter financial conditions for the financial sector led to a liquidity squeeze. The paper reports that the number of financial conglomerates with high liquidity utilisation jumped from three to 41 in a few days. Through this channel, the external shock exerted upward pressure on money market interest rates. The Czech National Bank paper prepared for this meeting (Babicky, 2010) also explains that there was a malfunctioning of the money markets in early October 2008.

In contrast, Ibrahim (2009) reports that activities in the Malaysian ringgit interbank market were unaffected. Overnight and benchmark rates in the interbank market remained stable and trading at a tight spread. He also adds that price and yield movements in domestic capital markets were not driven by external factors.

[10] See "México: Reporte Económico Diario", *Banamex*, no 446, 28 October 2008.

Some of the stresses are reflected in available cross-country data. Interest rates rose in early October 2008 in several economies (Annex, Graph A2), including in Hong Kong SAR, India, Singapore; and in Argentina, Chile, Mexico and Peru. The upward movement in interest rates in Hong Kong SAR (about 300 bp) and Singapore (about 100 bp) happened at the time when the yield curve shifted upwards. Hong Kong SAR and Singapore are open economies with close links with international markets. In the case of India, while the interbank rate rose (about 450 bp), the overnight rate jumped even more, so that the spread between the one-month and the overnight rates fell briefly to almost –450 bp. That period has been characterised as one of severe financial distress in money markets. In Argentina, the interbank market also underwent a period of intense stress with overnight and short-term money market rates rising by about 500 bp. In Chile, interbank money market rates increased marginally before the markets entered a brief period of volatility. Immediately afterwards, they fell quickly, although the reduction exceeded the fall in the overnight contemporaneous rate (the interest rate that conveys information about future monetary policy).

Financial stress lasted longer in Mexico and Peru. The movements in interest rates in the interbank market were relatively moderate but there were concerns about potential threats to the economy. Sidaoui, Cuadra and Ramos-Francia (2009) explain that stress in the interbank market stemmed from the fall in the value of collateral and increased counterparty risk. In the case of Peru, the interbank money market rate rose marginally, but during October, the overnight rate entered a period of volatility, possibly due to expectations of a reduction in the policy rate.

Local currency government debt markets

The performance of the local currency government debt market during the crisis is of importance because many EMEs have made considerable efforts to develop them. The paper prepared by the SARB ((2010), this volume) observes that bond spreads and premia generally soar for government debt in EMEs during a crisis (see also BIS (2009)), and this is particularly the case for local currency government debt and other securities that are subject to considerable exchange rate risk.

However, local currency government bonds do not appear to have been particularly affected in EMEs this time around. The central bank questionnaire responses are quite sanguine about the government bond market reaction to the crisis. The periods of stress reported are generally seen as having originated elsewhere (ie global risk aversion, or in the FX market, etc) rather than reflecting specific conditions in the government bond market (see episodes of stress in Graphs 1 and 4 of the Supplementary Graphs and Tables and in the Annex). Only a handful of countries experienced a marked disarray that forced a policy change. In particular, average spreads between longer-term government bond yields and money market rates during the period of global market turbulence were not necessarily higher than prior to the collapse of Lehman Brothers (Table 2); however, spreads subsequently rose.

When the financial crisis erupted in September 2008, international and local currency sovereign bond prices fell sharply (Graph 2, left-hand panel). Returns turned positive in the last quarter of the year but the performance of domestic currency bonds suffered in the first quarter of 2009 from a new bout of heightened FX risk. In addition, volatility rose quite markedly across EMEs but more significantly in Latin America and emerging Europe. Differences in the performance of local currency are not clear. Solvency indicators – in particular, debt/GDP and debt service/government revenue – do not differ greatly among regions, on average. Liquidity indicators are considerably better in emerging Asia (ie reserves/government debt).

The effects of the financial crisis on government debt markets varied across economies. In Mexico, the financial crisis hit the local currency government bond market particularly hard. Sidaoui, Cuadra and Ramos-Francia (2010) explain that a sharp deterioration in

creditworthiness in the corporate private sector led to greater uncertainty in the economy that spread to financial markets. The government yield curve steepened considerably and higher short-term interest rates put great pressure on several parts of the financial system (eg mutual funds).

Table 2

Government debt markets[1]

	Government bond market five-year to three-month spread[2]		
	1 Aug 07– 31 Aug 08	1 Sep 08– 31 Mar 09	1 Apr 09– 31 Dec 09
Emerging Asia			
China	0.7	0.7	1.6
Hong Kong SAR	1.4	1.5	1.7
India	0.5	0.7	3.4
Indonesia	2.1	3.0	2.6
Korea	0.4	1.4	2.6
Malaysia	0.1	0.4	1.6
Philippines	3.8	2.9	3.9
Singapore	0.7	1.0	1.0
Thailand	1.1	0.6	2.0
Latin America			
Argentina	–0.2	–3.8	1.2
Brazil	1.4	0.9	2.7
Chile	0.1	–0.7	3.9
Colombia	1.5	1.5	3.4
Mexico	0.2	0.3	2.2
Peru	1.2	0.6	1.2
Other emerging markets			
Czech Republic	0.3	–0.3	1.3
Hungary	–0.4	–1.4	–0.4
Israel	1.9	3.2	4.6
Poland	–0.0	–0.9	1.1
Russia	0.6	1.8	4.4
Saudi Arabia	...	...	...
South Africa	–2.1	–3.7	0.5
Turkey	1.4	0.5	1.9
Median for all EMEs in table	0.7	0.7	1.9

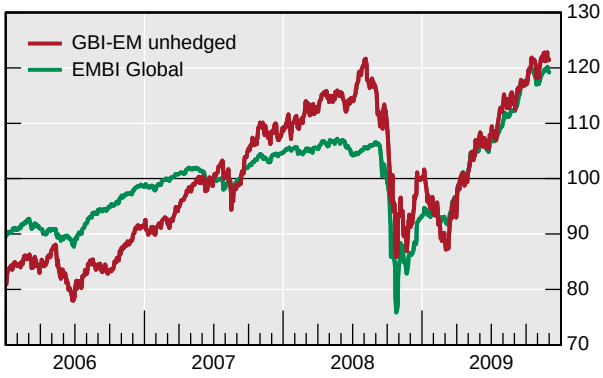
[1] Period averages, in percentage points. [2] Government bond rate for Argentina, central bank issues at issue, closest to one-year maturity (one-year maturity until February 2007); for Israel, eight-year government bond; for the Philippines, 10-year government bond; for Turkey, two-year government bond.

The government took steps to counter the disruptions in the government bond market with some policy changes that sought to facilitate the adjustment of financial sector balance sheets and reduce the pressures on asset prices (see Moreno (2010)). The participation of foreign investors in the local currency bond market fell considerably during the crisis (Jara, Moreno and Tovar (2009)).

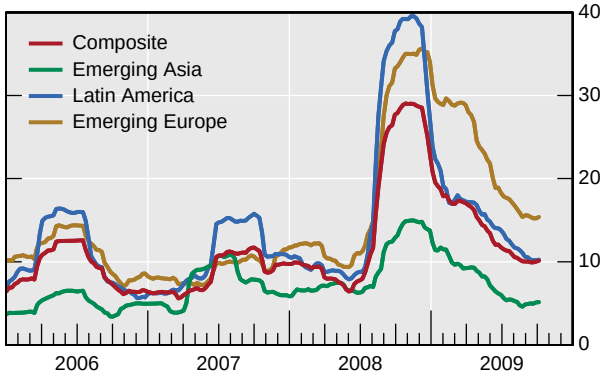
Graph 2

Returns and volatility in domestic government bond markets

Total return index, 2006–09 = 100



Rolling volatility of local government bonds



The Czech Republic went through a less disruptive experience. The Czech National Bank paper for this meeting (Babicky (2010)) explains that the government risk premium increased by about 350 bp (gauged by the CDS spread) and that the government had to alter its debt management policy: the amount of bonds issued was cut down and auctions had to take place once a month. Short-term government paper (T-bills) remained well bid, though bid-ask spreads widened somewhat. In Brazil, the government auction planned in November 2008 did not take place.

Several central banks reported that yields widened in local currency government bond markets but there was no major disruption. In Peru, government bond yields recorded a mild increase. In Turkey, government bond yields also increased but there was no report of market disruption. Other countries where central banks reported the effects of global risk aversion as a main influence on market dynamics are Colombia and South Korea, although there does not appear to have been any major market disruption.

Some central banks do not see the global financial crisis as the main cause of stress in the government bond market. Ibrahim ((2010), this volume) explains that, in Malaysia, the unwinding of foreign investors' portfolio investments pushed and sustained yields at elevated levels in early 2008 but, following the collapse of Lehman Brothers, government bond yields trended downwards in response to monetary policy actions and a flight to quality. In early 2009, an expansionary fiscal policy put pressures on yields once again. Al-Hamidy (2010) also reports that the financial crisis did not have any major impact on the local currency government bond market as the government had paid down a large share of it and investors in those bonds did not disinvest. In its response to the questionnaire, the Reserve Bank of India (RBI) emphasises the more prominent role fiscal policy played in government bond market developments in late 2008 and afterwards. The RBI paper attributes it to a calibrated opening of the market to foreign investors. There was some activism in debt management policy in order to guarantee greater coordination with monetary policy (see RBI (2010), this volume).

In Hong Kong SAR, the monetary authority reports that flight to quality took place in the government bond market – in particular at very short maturities. The demand for these debt securities (and other safe ones) surged on the back of banks' demand. These securities helped banks to secure their borrowing in the collateralised interbank markets and preserved the liquidity in the market for their liabilities.

IV. Conclusion

The global financial crisis that started in the second quarter of 2007 eventually spread to many EMEs, particularly following the bankruptcy of Lehman Brothers in September 2008. The problems affecting the international interbank market and other funding markets in the developed economies determined that many EMEs became a source of global dollar liquidity. The consequences for these economies, where financial markets are less developed, were significant. Initially, the policy response in developed markets helped to sustain capital flows to EMEs. But the financial panic that followed the bankruptcy of Lehman Brothers led to a deep, extreme and prolonged period of financial stress in EMEs. Its consequences were felt across many EMES and made policymakers fear that they would bring significant financial and economic costs for their economies. The impact of the crisis on different financial markets across EMEs, as this paper illustrates, has not been homogenous. Whether financial markets have fully recovered or are still vulnerable to large shocks remains an open question.

Annex

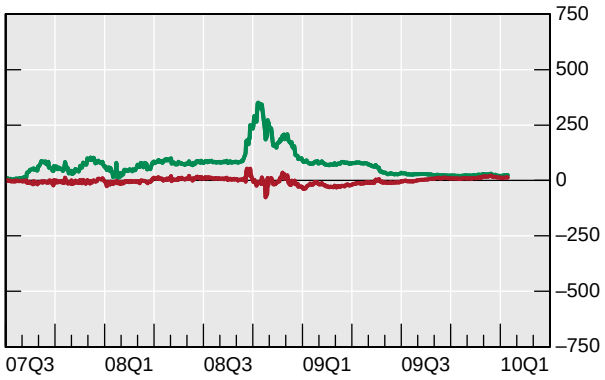
Graph A1

FX market: swap-implied foreign rate spreads[1, 2]

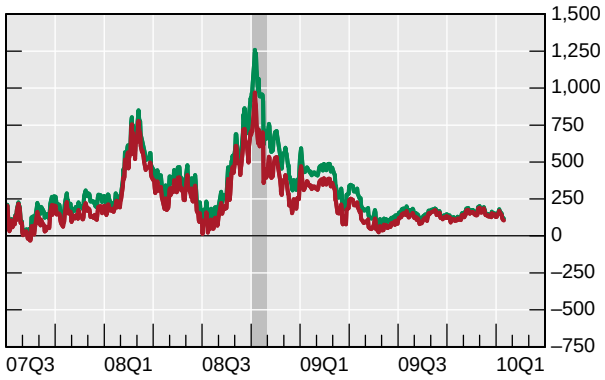
In basis points

Emerging Asia

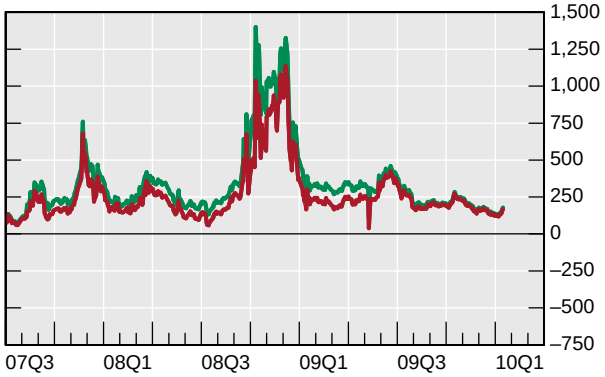
Hong Kong SAR



India

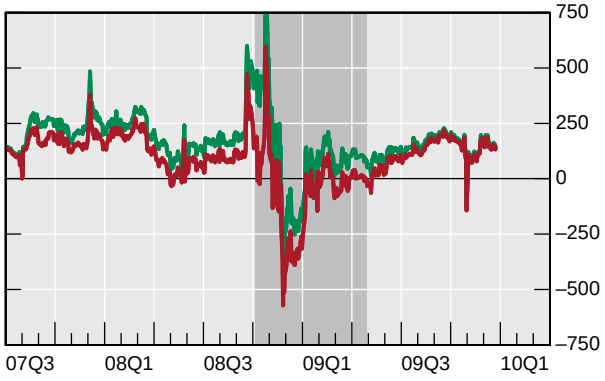


Korea

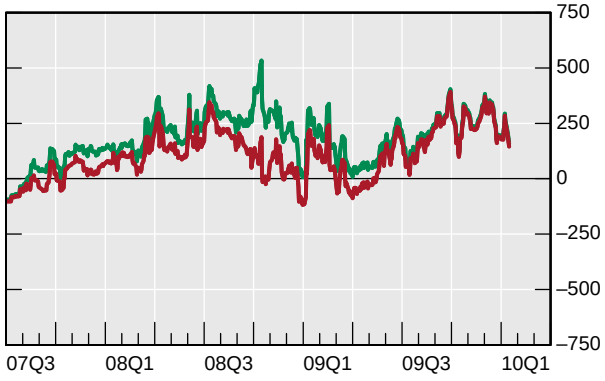


Latin America

Brazil[3]



Chile

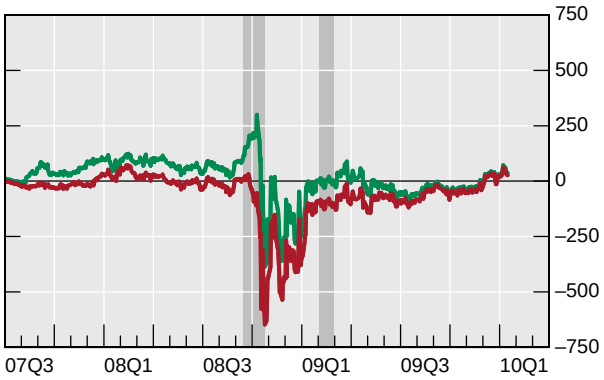


Graph A1 (cont'd)

FX market: swap-implied foreign rate spreads[1, 2]

In basis points

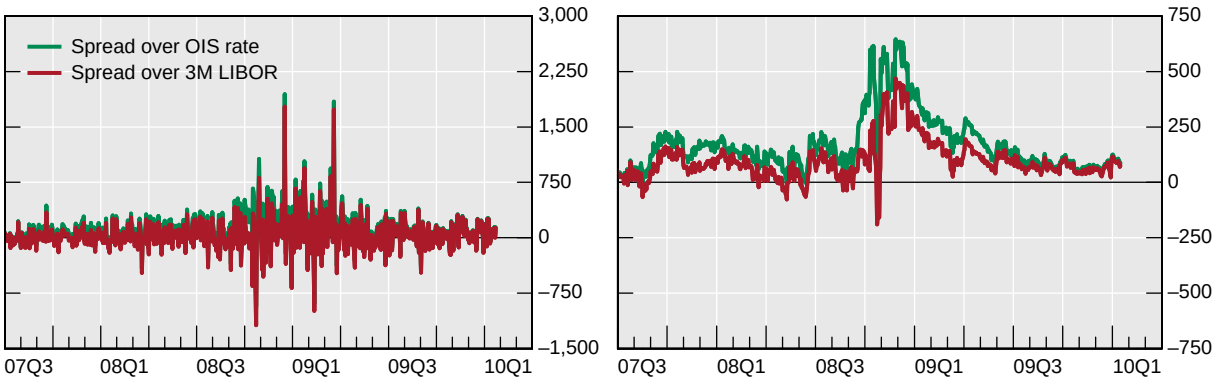
Mexico



Emerging Europe

Czech Republic

Turkey



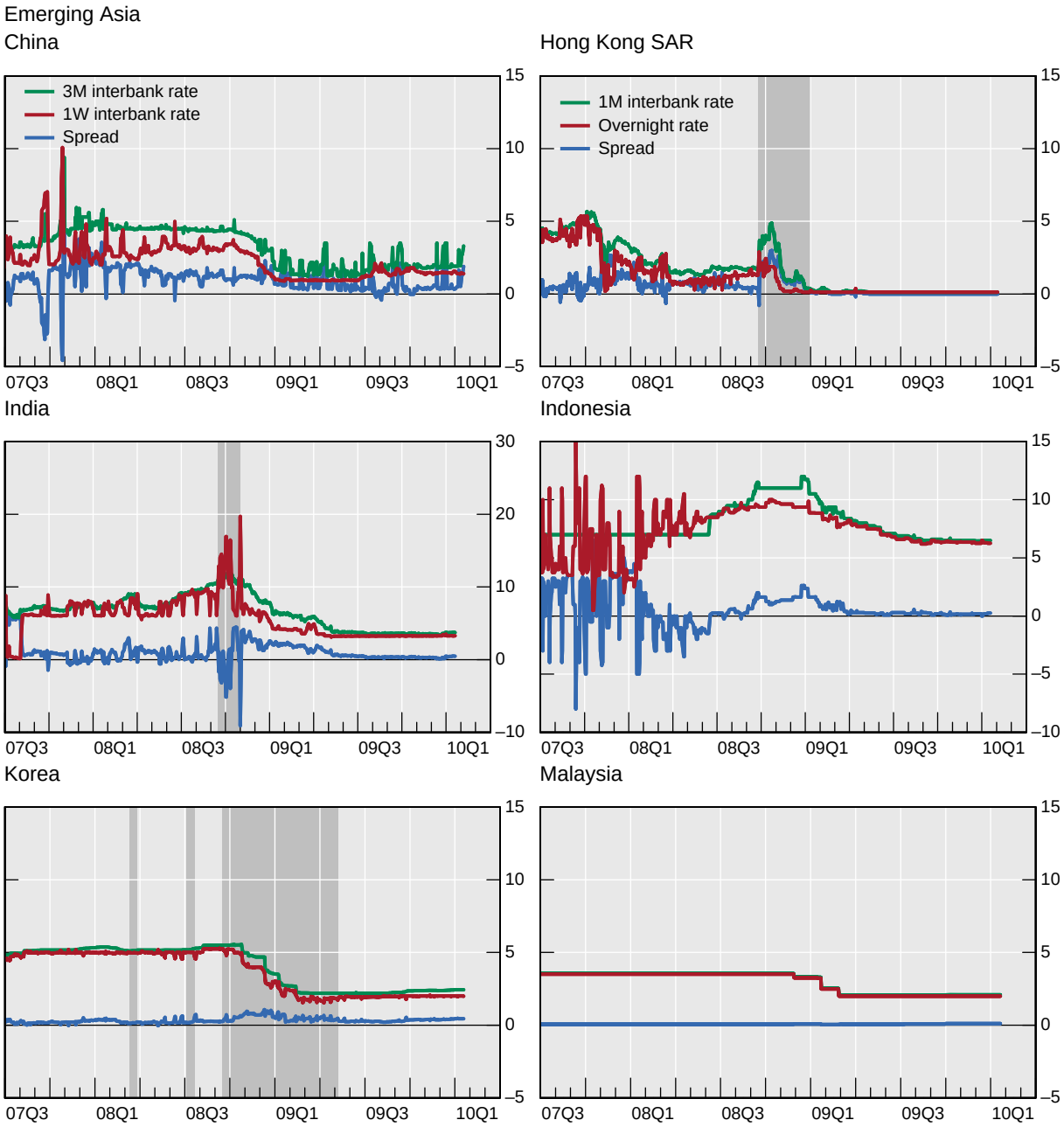
[1] Spreads of implied US dollar rate over Libor or OIS rate; implied rates calculated using local currency to US dollar 3M forward rates, spot exchange rates against US dollar and local interbank market rates (3M maturity). [2] Shaded areas correspond to central bank-reported episodes of stress in the FX market. [3] In Brazil, the spread over OIS reached 856.5 bp on 24 October 2008.

Sources: Bloomberg; Datastream; JPMorgan; national data; BIS calculations.

Graph A2

Local interbank and money markets[1, 2]

In percentage points

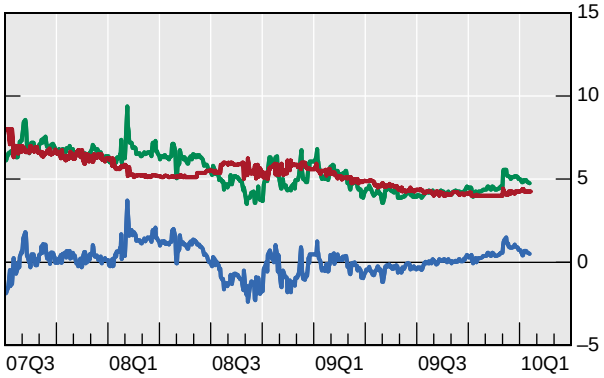


Graph A2 (cont'd)

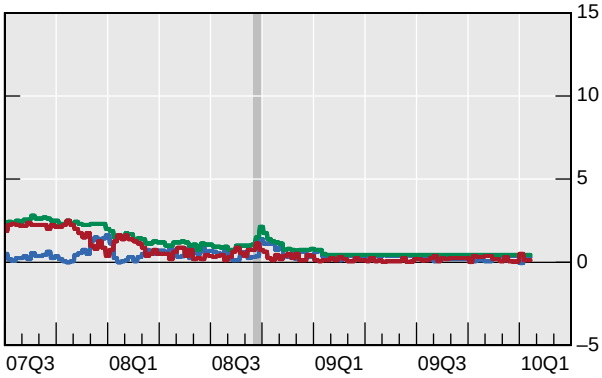
Local interbank and money markets[1,2]

In percentage points

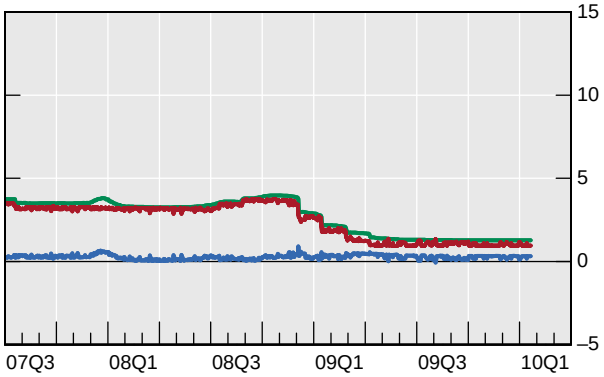
Philippines



Singapore

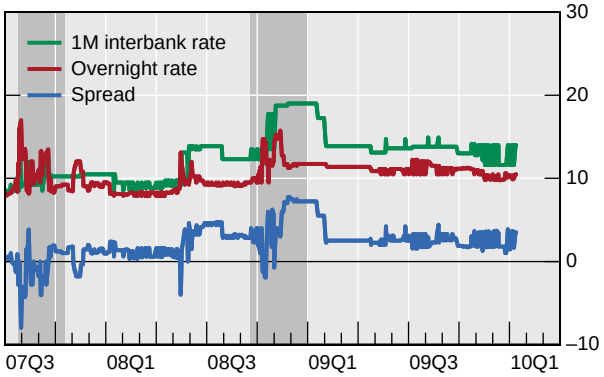


Thailand

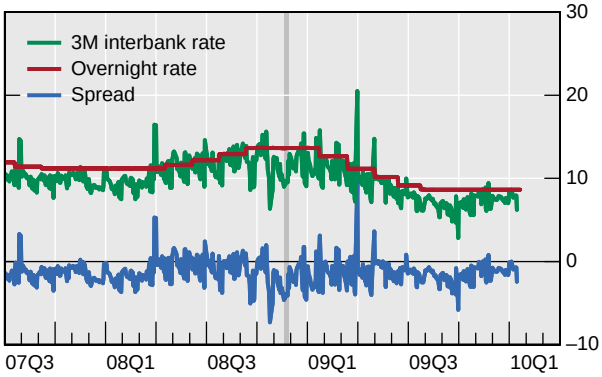


Latin America

Argentina



Brazil

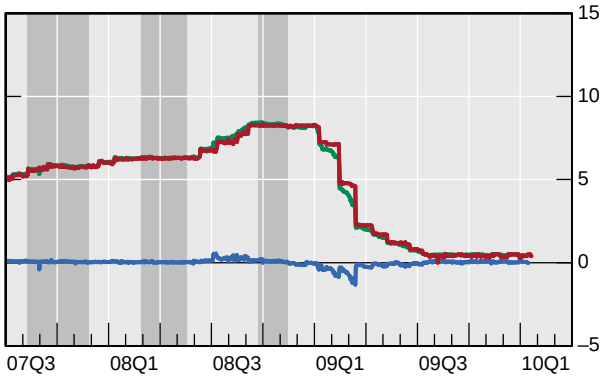


Graph A2 (cont'd)

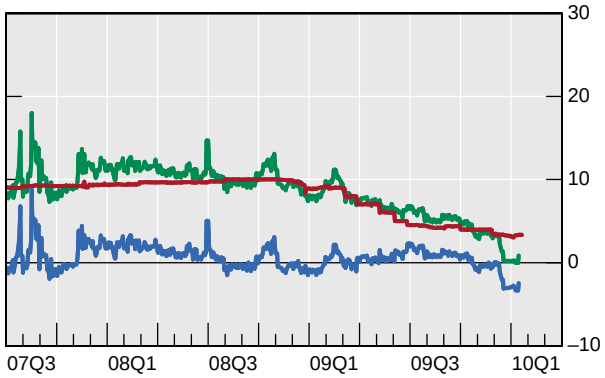
Local interbank and money markets[1,2]

In percentage points

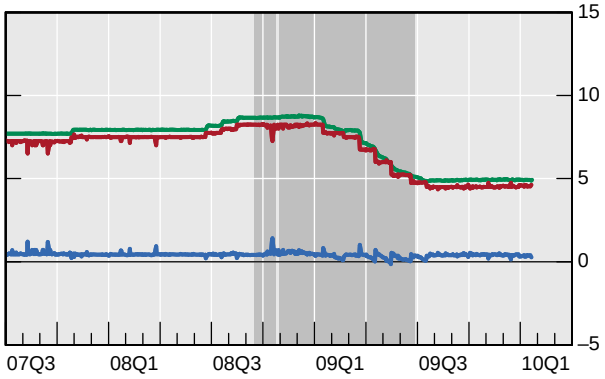
Chile



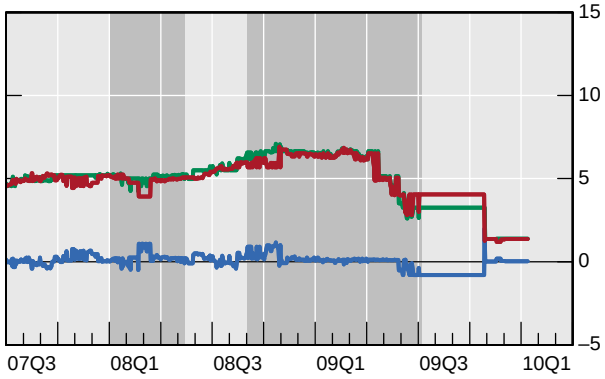
Colombia



Mexico

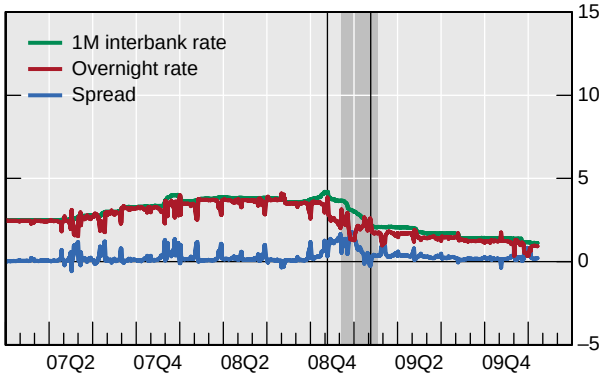


Peru

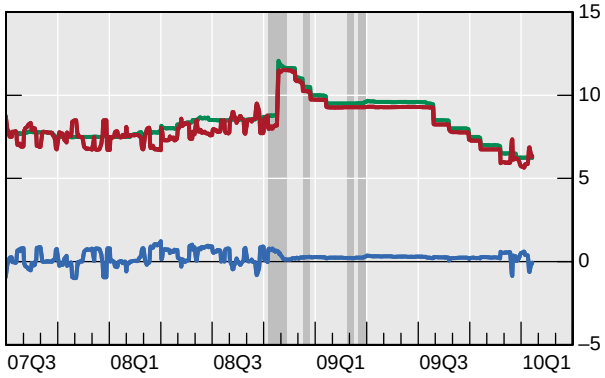


Emerging Europe

Czech Republic



Hungary

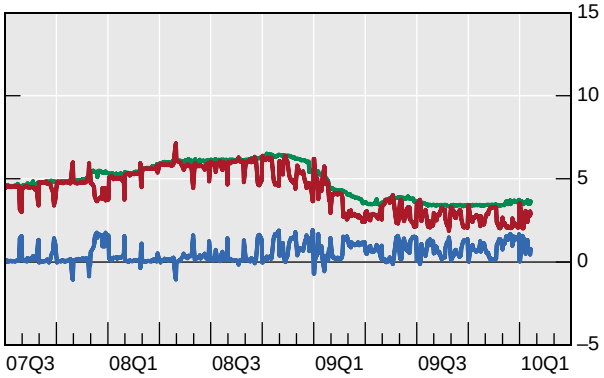


Graph A2 (cont'd)

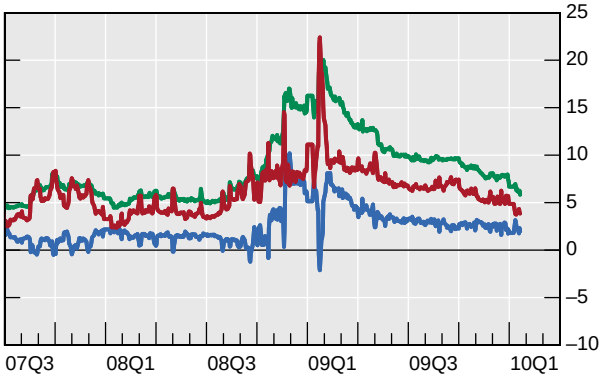
Local interbank and money markets[1,2]

In percentage points

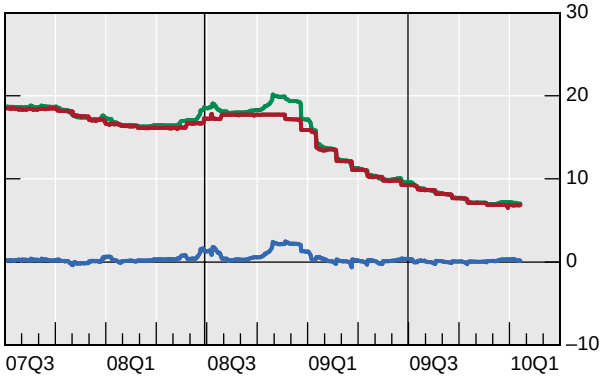
Poland



Russia

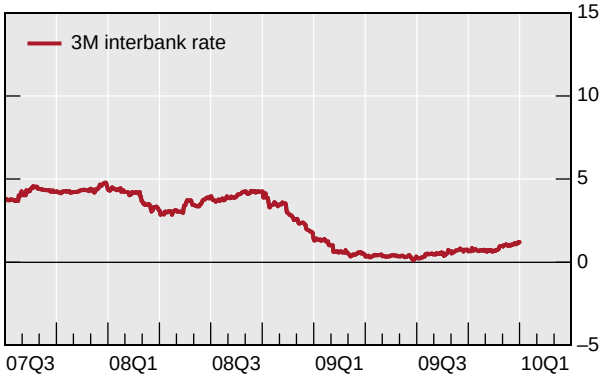


Turkey

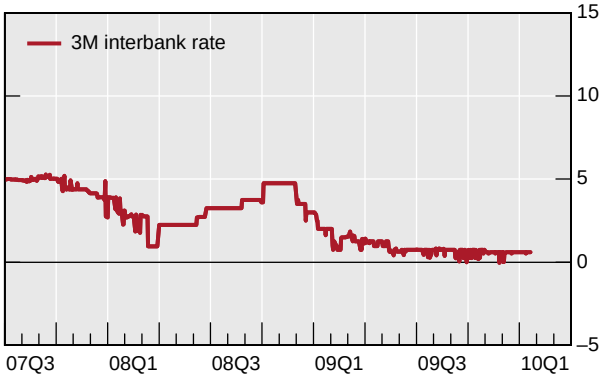


Other emerging

Israel



Saudi Arabia

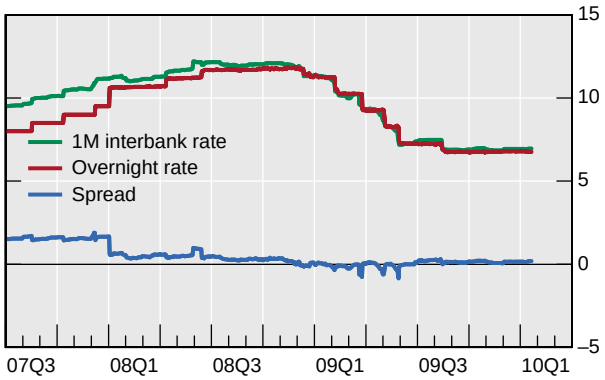


Graph A2 (cont'd)

Local interbank and money markets[1,2]

In percentage points

South Africa



[1] Graphs show one-month interbank and overnight rates, unless indicated otherwise. [2] Shaded areas correspond to central bank-reported episodes of stress in local interbank and money markets.

Sources: Bloomberg; CEIC; Datastream; national data.

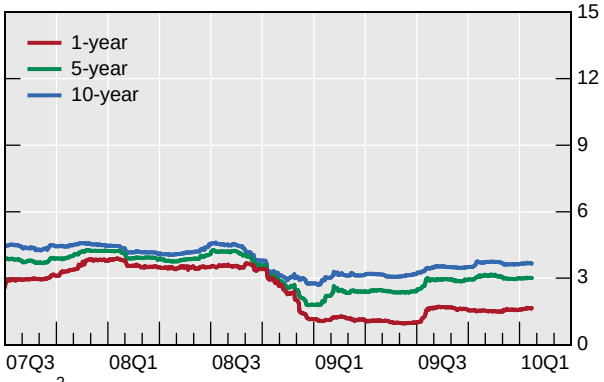
Graph A3

Government bond markets[1]

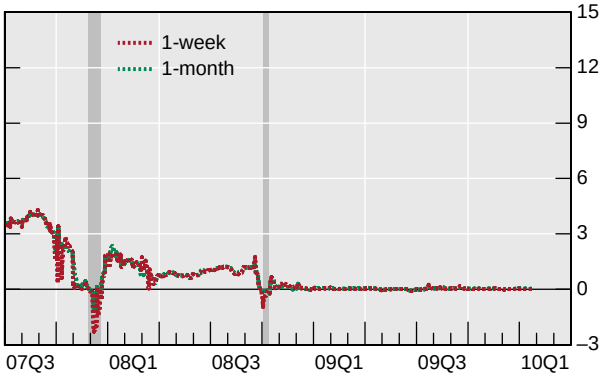
Yields in percentage points

Emerging Asia

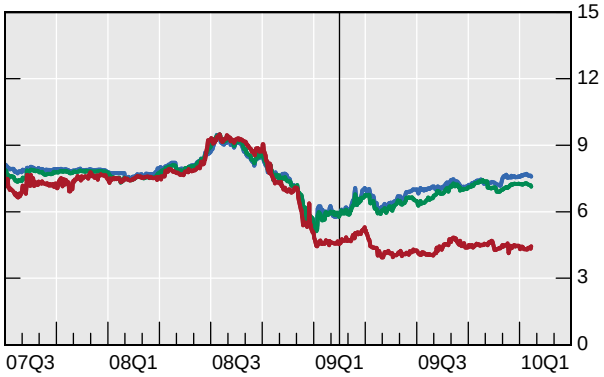
China



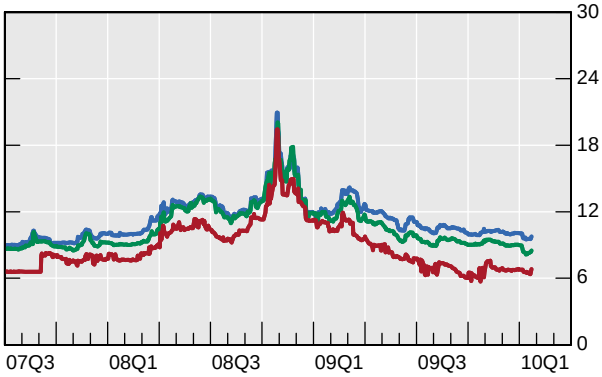
Hong Kong SAR



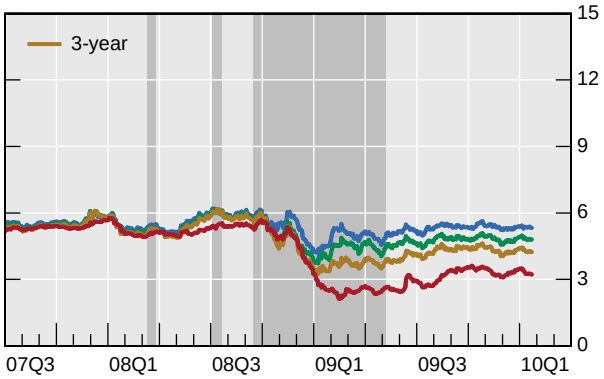
India[2]



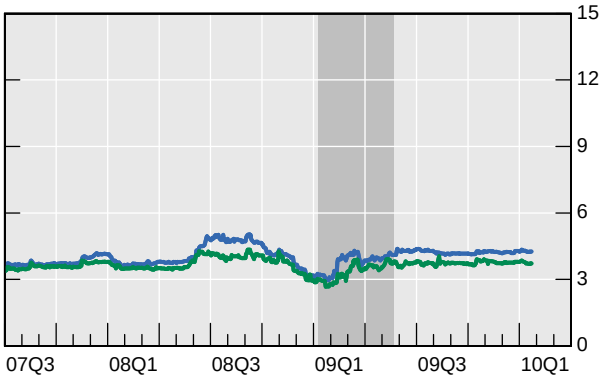
Indonesia



Korea



Malaysia

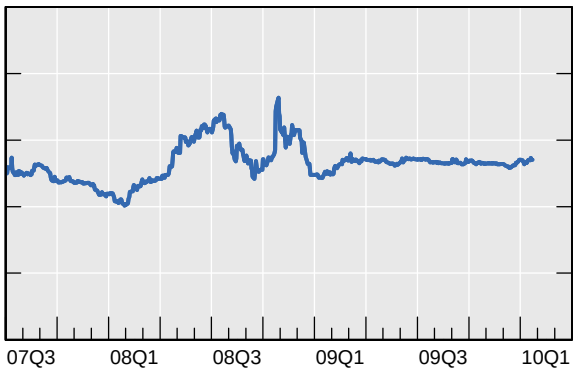


Graph A3 (cont'd)

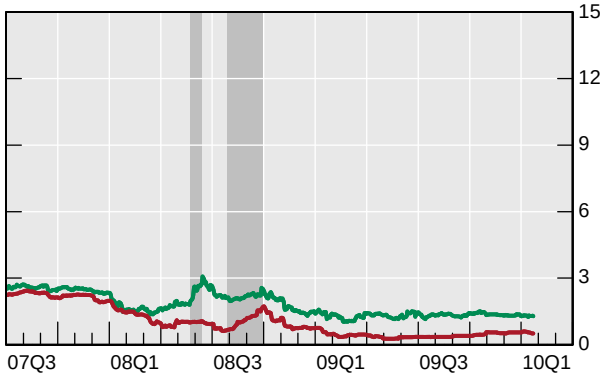
Government bond markets[1]

Yields in percentage points

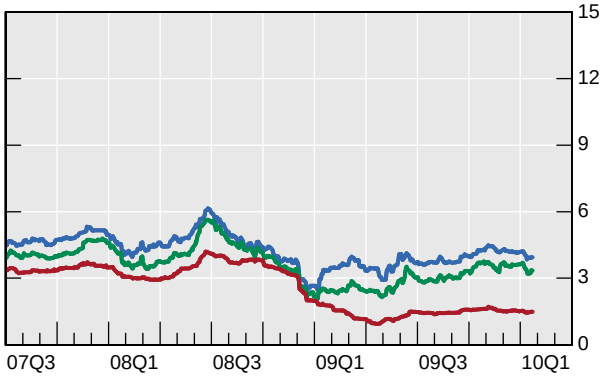
Philippines



Singapore

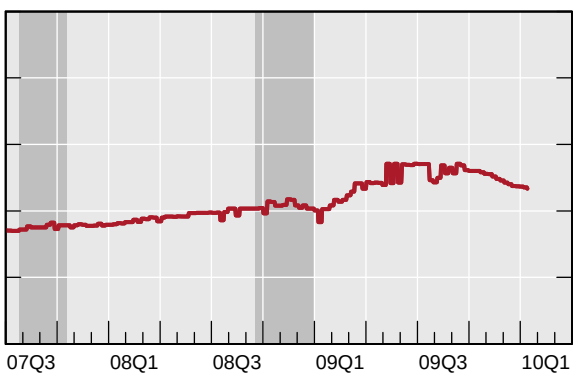


Thailand

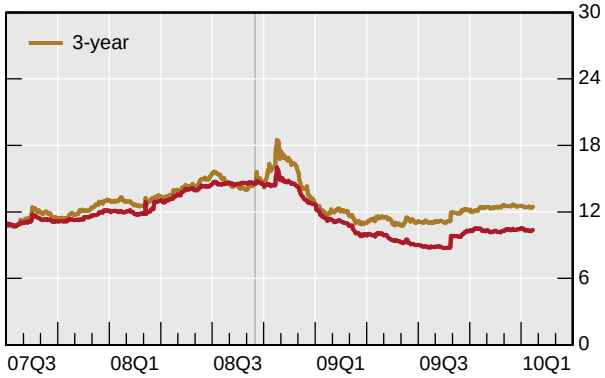


Latin America

Argentina



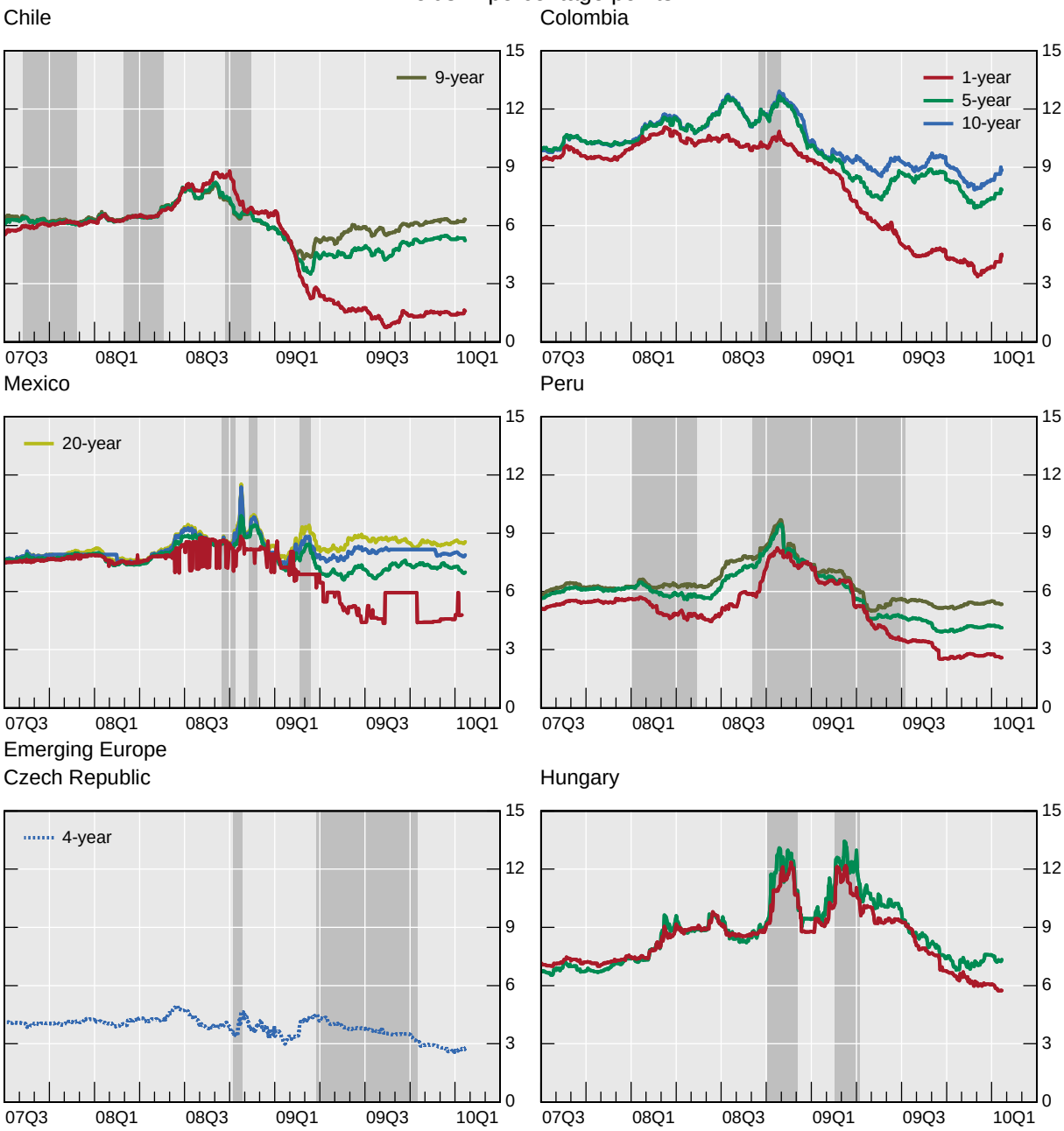
Brazil



Graph A3 (cont'd)

Government bond markets[1]

Yields in percentage points

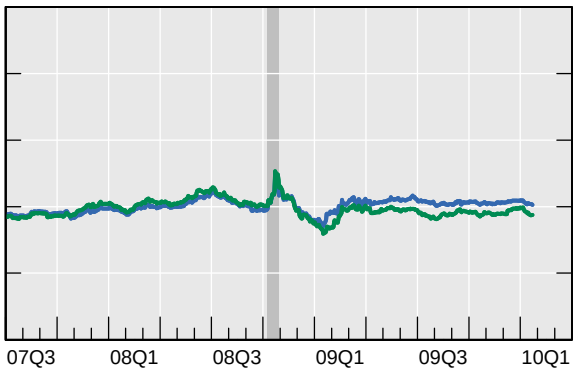


Graph A3 (cont'd)

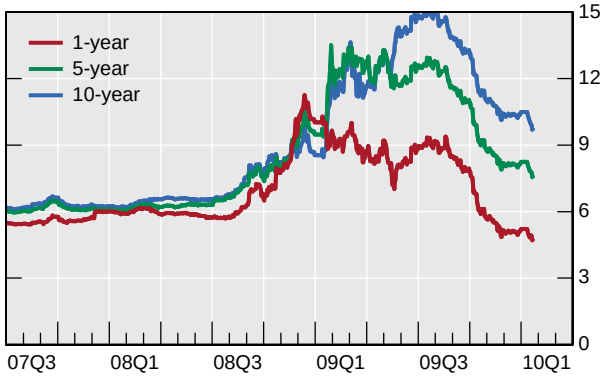
Government bond markets[1]

Yields in percentage points

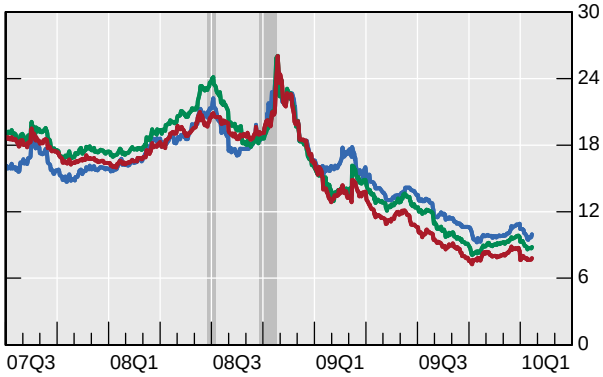
Poland



Russia

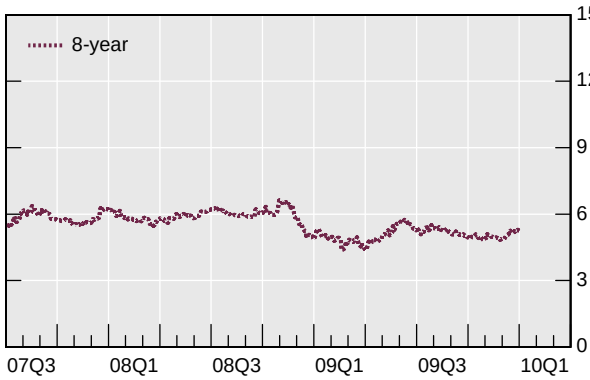


Turkey

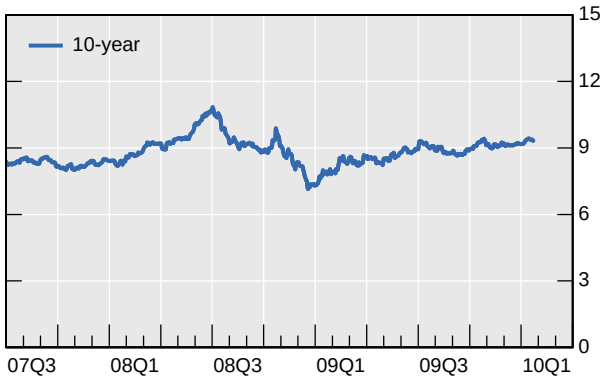


Other emerging

Israel



South Africa



[1] Shaded areas correspond to central bank-reported episodes of stress in the government bond markets. [2] In India, from mid-February 2009, due to higher borrowing requirements by the government, the long-term yields firmed up on the back of concerns over excess supply.

Sources: Bloomberg; national data.

References

Al-Hamidy, A (2010): “The global financial crisis: impact on Saudi Arabia”, this volume.

Baba, N and F Packer (2009a): “Interpreting deviations from covered interest parity during the financial market turmoil of 2007–2008”, *Journal of Banking & Finance*. Also issued as *BIS Working Papers*, no 267, December 2008.

———(2009b): “From turmoil to crisis: dislocations in the FX swap market before and after the failure of Lehman Brothers”, *BIS Working Papers*, no 285, July.

——— and T Nagano (2008): “The spillover of money market turbulence to FX swap and cross-currency swap markets”, *BIS Quarterly Review*, March, pp 73–86.

Babicky, V (2010): “The international banking crisis and domestic financial intermediation in the Czech Republic”, this volume.

Bank for International Settlements (2009): *Annual Report*, 29 June, Basel.

Bank of Israel (2010): “Domestic bank intermediation: domestically owned versus foreign-owned banks”, this volume.

Central Bank of Chile (2009): *Informe de Estabilidad Financiera*, July.

Duffie, D and M Huang (1998): “Swap rates and credit quality”, *Journal of Finance* 51 (2), pp 921–50.

Fung, L and I Yu (2010): “Dislocations in FX swap and money markets in Hong Kong during the global credit crisis of 2007–2008”, this volume.

Ibrahim, M (2010): “Impact of the global crisis on Malaysia's financial system”, this volume.

Jara, A, R Moreno and C Tovar (2009): “The global crisis and Latin America: financial impact and policy responses”, *BIS Quarterly Review*, June.

Mák, I and J Páles (2009): The role of the FX swap market in the Hungarian financial system, *MNB Bulletin*, May.

Mesquita, M and M Toros (2010): “Brazil and the 2008 panic”, this volume.

Moreno, R (2010): “Central bank instruments to deal with the crisis”, this volume.

Obstfeld, M, J C Shambaugh and A M Taylor (2009): “Financial instability, reserves, and central bank swap lines in the panic of 2008”, *American Economic Review*, American Economic Association, vol 99(2), pp 480–6, May.

Saxena, S and A Villar (2008): “Hedging instruments in emerging market economies*”, BIS Papers*, no 44.

Sidaoui, J, G Cuadra and M Ramos-Francia (2010): “Global financial crisis and policy response in Mexico”, this volume.

Sinha, A (2010): “Impact of the international banking crisis on the Indian financial system”, this volume.

South African Reserve Bank (2010): “The international banking crisis and domestic financial intermediation in emerging economies: issues for South Africa”, Basel, 28–29 January, mimeo.

Takats, E (2010): “Cross-border bank lending to emerging market economies”, this volume.