

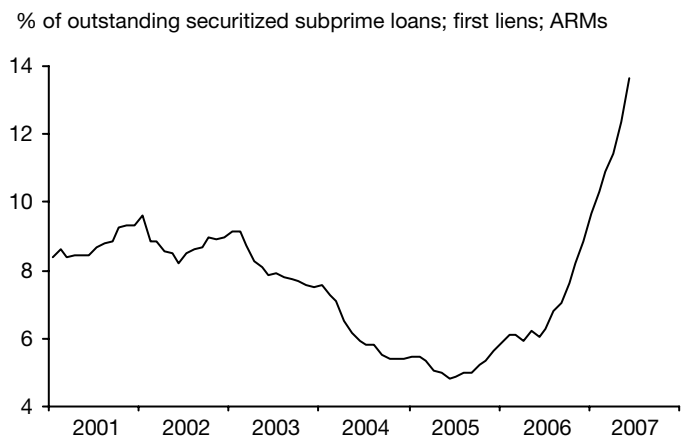
What's Going On in the U.S. Mortgage Markets and What It Means for Emerging Markets

- **The defining event in global financial markets over the past 6 weeks has been turmoil spreading from the U.S. sub-prime mortgage market.** This began as a credit market event resulting from growing concerns about the sharp rise in defaults on sub-prime mortgages in the United States. More recently, however, it has become a liquidity event with holders of mortgage securities finding it very difficult to roll-over short-term financing in the commercial paper (CP) market.
- **Problems in the U.S. mortgage market will continue for a while.** Upcoming resets on adjustable rate sub-prime mortgages will likely further raise the default rate from an already-high 13.7 percent in July. And the CP rollover problem is likely to linger.
- **Given these uncertainties, volatility in emerging markets should be expected to persist, but with limited fundamental effects.** Global risk appetite has fallen sharply, leading to a rise in credit spreads. Whereas such a development would have put great stress on many large emerging markets as recently as 2002-03, improvement in underlying emerging market fundamentals (less borrowing and better liability management) mean that wider spreads are not, in most cases, a major problem.
- Many emerging market currencies have been pushed up sharply in recent quarters by huge inflows attracted by higher local interest rates. **There are now signs of some of these carry trades being reversed, and this will be an important test of local market flexibility and maturity.** Countries with large current account deficits will face a particular challenge.
- **Watch for losses by asset holders domiciled in emerging economies.** Much of the recent turmoil occurred once losses on securities linked to U.S. sub-prime debt began to be realized. So far, all the high profile losses have been in mature economies. To date, indications are that banks in emerging economies have rather limited direct involvement in the U.S. sub-prime securities markets.
- **Residential mortgage growth has been substantial across a number of emerging economies in recent quarters.** Investor willingness to commit capital to housing could fade globally in coming months.
- **Global growth concerns.** U.S. consumption looks as though it could be headed into a weaker phase, having survived the first leg of the U.S. housing downturn remarkably well. Watch commodity prices as a key indicator of whether global growth is turning less emerging market friendly.

Nature of mortgage market difficulties in the U.S.

Extreme weakness in the U.S. sub-prime mortgage market has been evident throughout 2007 (Chart 1). The sector's difficulties intensified in mid-July, triggered in part by the collapse in some high-profile hedge funds and the announcement of sizeable losses on its mortgage portfolio by a mid-sized German bank. There was a sharp widening in credit spreads across all securitized pools of sub-prime mortgages, even those supposedly quite safe from default risk because of their senior claim on cash flows. Rating agencies' downgrades of a long list of structured products linked to sub-prime mortgages exacerbated price declines not only through the direct channel, but also through engendering doubts about the validity of the ratings on such complex structured products. In the meantime, the widely dispersed risks through the use of illiquid structured products has made the assessment of where sub-prime losses lie very difficult, leading to heightened sensitivity to counterparty risk. The sharply elevated uncertainty about valuation and creditworthiness of counterparties led to a plummeting of liquidity in sub-prime-linked segments of financial markets. This has turned the sub-prime mortgage rout from a credit event to a liquidity event.

Chart 1: U.S. subprime mortgage loans 60 or more days past due or in foreclosure



Two factors helped drive this shift in August. First, a leading European asset manager suspended withdrawals from one of its mutual funds containing sub-prime structured products, on the basis that the fund had no accurate way to value the portfolio. Second, many of the large holders of these structured pools of sub-prime mortgages—so called, Special Investment Vehicles (SIVs)—were funding themselves by issuing short-term asset-backed commercial paper. Not surprisingly, investors in this commercial paper (mainly risk-averse money market funds) took immediate fright, and began to demand safer assets, such as Treasury bills. Denied short-term CP funding, the SIVs began to draw

aggressively on backstop bank lending lines that had been established when credit conditions were far more favorable. All of a sudden, many of the world's largest commercial banks found themselves with a surge in lending to SIVs whose asset quality is not just impaired, but even (given the extreme lack of market liquidity and collapse in faith about the ratings agencies' assessments) somewhat indeterminate.

As a result, banks themselves have been scrambling for liquidity and some extremes have opened up in relative pricing both between banks in the inter-bank market (tiering), as well as between key short-term market rates, such as LIBOR, CP and Treasury bills.

An additional (but separate) factor straining commercial banks' balance sheets has been the persistence of a number of large leveraged buy-out (LBO) related bridge loans, which have not been able to be sold into the market as longer-term bonds because of mortgage-related financial turbulence.

Faced with an extreme flight to quality amid a steep climb in market risk aversion, and a shortage of inter-bank funding that was pushing money market rates well above their target rates, the major global central banks have added massive amounts of liquidity to money markets in recent days. Rather than an outright monetary easing, the move was a concerted global effort to reverse a *de facto* market tightening.

On August 17th, the Fed took the unusual steps of cutting its discount rate (which has been set at 100bp above the Fed funds rate) by 50bp and encouraging the active use of this window by permitting discount loans to be extended for up to 30 days without stigma. Furthermore, the FOMC issued an unusual inter-meeting statement noting that downside growth risks had "increased appreciably". Markets now expect the Fed to follow through on these actions by trimming the key Fed funds rate by at least 50bp in coming months.

Implications for emerging markets

The ongoing deterioration in the U.S. housing and mortgage finance markets has already affected emerging markets through a whole series of transmission mechanisms. Some of those mechanisms are fast working – for example, the impact on both emerging market credit and local markets from a sharp reversal in risk appetite. Other influences will take more time to play out—for example, the damage done to longer-term economic growth in emerging economies, and whether U.S. mortgage damage dampens the growth of mortgage markets in emerging economies. Another uncertainty is whether recent turmoil has led to financial losses for investors domiciled in emerging economies that have not yet become publicly acknowledged.

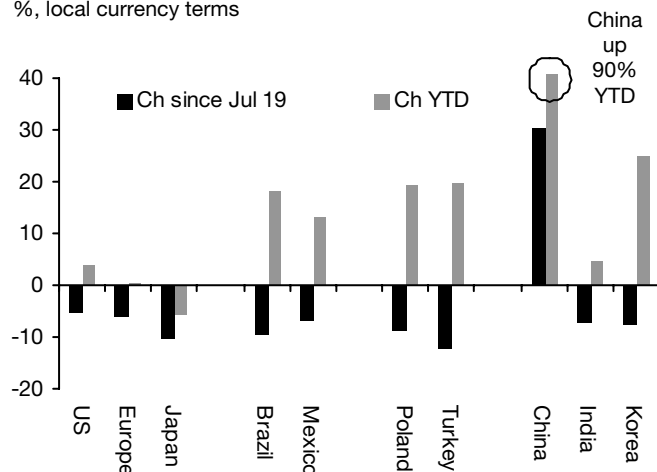
Despite all these linkages, however, it is impressive that emerging market financial markets have so far been remarkably resilient to turmoil in mature markets.

The impact of a global re-pricing of risk, and reduction of risk positions across financial markets

The uncertainties to the global economic outlook produced by this U.S.-centered financial turmoil have pushed up virtually all measures related to perceived risk in global markets such as implied equity risk premia, currency volatilities and credit spreads. Importantly, while emerging markets have been caught up in these developments, they have (so far at least) not been disproportionately affected. This is evident in global equity markets, which have generally followed a common pattern since mid-July (Chart 2).

Chart 2: Changes in global equity markets

%, local currency terms



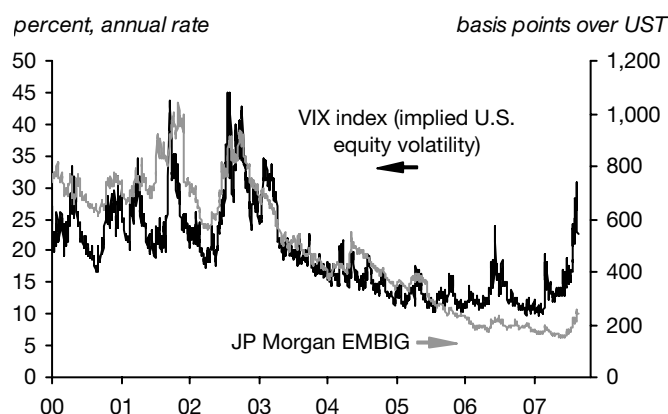
While all global equity markets have declined sharply in the past month (with the notable exception of China), the losses registered by emerging markets have not been disproportionate, especially when viewed against gains recorded in the first half of the year.

One measure of equity market uncertainty—the VIX index of implied U.S. equity market volatility—has spiked in recent weeks (see Chart 3 on next page). Similarly, the most-widely used benchmark for spreads on emerging market external debt instruments (JPMorgan's EMBIG) has widened by about 80bp since the onset of global turbulence in the middle of July (Chart 3), although the relationship of the latter to the former has certainly diminished since the VIX was last this high in 2003.

The tendency for spreads to widen across all global credit markets (emerging markets included) is a reflection both of a more uncertain global outlook, as well as the selling pressures that develop as credit investors cut positions across all segments of the market, having suffered concentrated losses in one area.

By historic standards, however, the recent re-pricing of risk on emerging market external debt is a remarkably small blip. There would appear to be good reason for this.

Chart 3: U.S. equity volatility and emerging market bond spreads



The solid performance reflects improved growth, inflation and balance of payments conditions across most emerging market economies (as reflected in credit ratings), sharply reduced borrowing needs, and the (self-insurance) benefit resulting from the accumulation of large stocks of official external assets. As a result, almost all key emerging market vulnerability indicators are much more favorable today than they were on the eve of the three major emerging market crises in the recent past (see Table 1).

Table 1: Emerging Market External Vulnerability Indicators
(percent)

	1994	1997	2000	2007e
External Debt/GDP				
Africa/Middle East	44.9	40.1	35.2	21.3
Asia/Pacific	32.1	32.8	29.2	18.7
Europe	41.0	40.6	51.8	42.4
Latin America	38.1	33.5	39.1	22.9
Short-Term Debt/Reserves *)				
Africa/Middle East	2.8	1.4	0.8	0.4
Asia/Pacific	1.0	1.3	0.4	0.2
Europe	1.8	1.8	1.0	0.5
Latin America	3.7	1.0	0.9	0.3

Note: Regional averages are GDP-weighted

*) Reserves excluding gold

e=estimate based on latest data

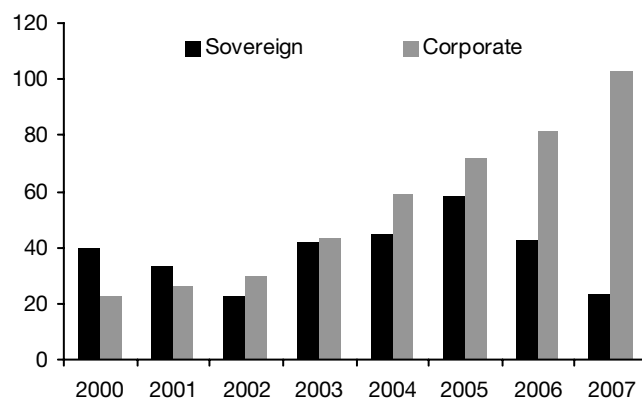
As should be expected from a general deterioration in global credit conditions, the fortunes of lesser credits have deteriorated in recent months relative to stronger ones. The poor performing credits, such as Argentina, have domestic difficulties compounding their international woes, underlining a degree of market discrimination in recent weeks.

Critically, emerging market borrowers—especially sovereign borrowers—have a much reduced need to issue in international credit markets, so more difficult global credit market conditions will have far less of an impact on

perceptions about their underlying solvency than was the case as recently as the last serious downturn in global credit in 2002-03. Issuance has indeed fallen in recent weeks, although much of this reflects the normal (northern hemisphere) summer slowdown, and it will be difficult to assess the true pattern of issuance until September. An increasing amount of emerging market issuance has been carried out by corporate rather than sovereign borrowers, however (Chart 4), and much of this borrowing was to finance acquisitions. To the extent that recent events in credit markets are making it more challenging for companies to undertake leveraged buyouts/takeovers, it would seem likely that this form of emerging market borrowing will be curtailed in the months ahead, in line with reduction in private equity/LBO activity underway in the mature markets. This would not seem too much of a threat to emerging market growth, however, and could even serve to shield commodity-exposed emerging economies in the event of a downturn in global commodity prices in 2008-09 or beyond.

Chart 4: International bond issuance (all currencies) by type of borrower

\$ billion (2007 is year-to-date)



While fundamental improvements have led to sharply reduced external and government borrowing needs, increased liquid assets, and longer debt maturity structures across a wide array of emerging economies, a number of emerging economies—especially in Emerging Europe—are still running sizeable external imbalances, which leave them somewhat vulnerable should a sudden stop in capital flows occur in the weeks and months ahead. Some of the more pronounced difficulties in markets in recent days have come in parts of the former Soviet Union.

Beware carry trade unwinds

The bulk of foreign debt capital flooding into emerging markets in recent quarters has been targeting local market returns. Such “carry trades” have been highly profitable, since investors have enjoyed the combination of higher current interest rates and foreign exchange appreciation when investing in local currency instruments. Of course, the same set of financial conditions that make local market carry

trades profitable for foreign investors also makes foreign currency borrowing profitable for local borrowers.

The magnitudes of these carry-trade inflows look to have been substantial, given the huge and persistent increases in foreign exchange reserves in emerging markets over recent months. For example, Brazil's foreign exchange reserves rose by \$70 billion in the first 7 months of 2007, even though the authorities were only dampening the pace of BRL appreciation (BRL indeed appreciated by 15 percent against USD over that period). Judging from available balance of payments data, many of the inflows fueling these gains have come from foreign investors building positions in local markets, either through direct holdings of local securities, or through structured notes.

The key uncertainties now are how many of these carry trades will be unwound, and how manageable these unwinds will be for local financial markets. In the early weeks of the recent mortgage turmoil, local markets in emerging countries had been remarkably resilient to tensions developing in other markets. Indeed, there was something of a decoupling underway, with emerging market external debt

markets subject to spillover from the global credit market deterioration, but key emerging market local conditions still being driven primarily by country-specific factors. For example, Brazilian markets showed some signs of this decoupling, with the BRL continuing to strengthen through the early phase of spread widening in the Brazilian external debt market (see Chart 5).

Chart 5: EMBI global spread over UST and the Brazilian real

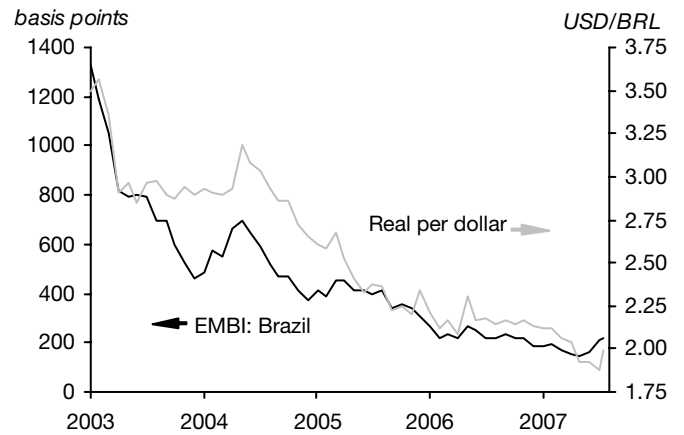
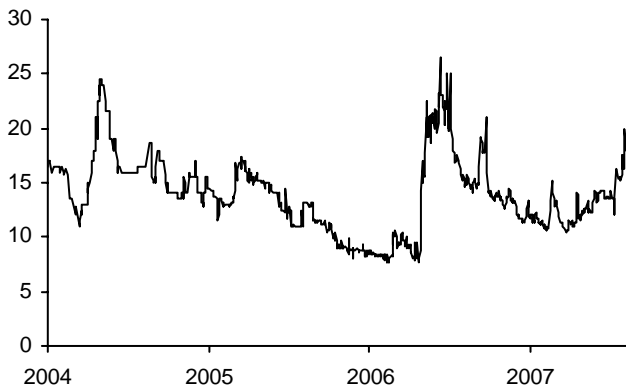


Chart 6: Implied currency volatilities

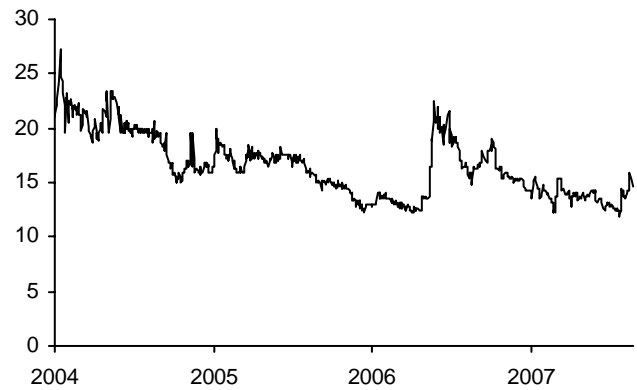
Turkish lira

3 month annualized volatility, at the money call option



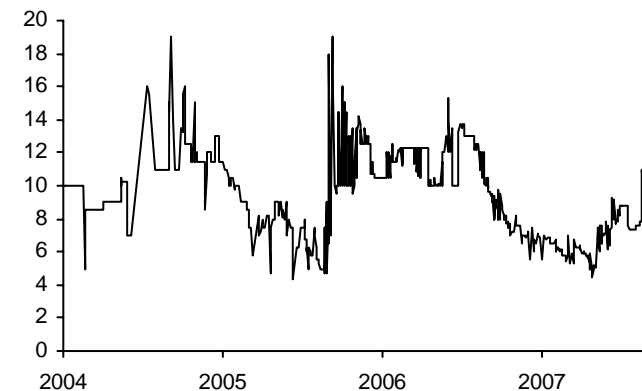
Brazilian real

3 month annualized volatility, at the money call option



Indonesian rupiah

3 month annualized volatility, at the money call option



South Africa rand

3 month annualized volatility, at the money call option

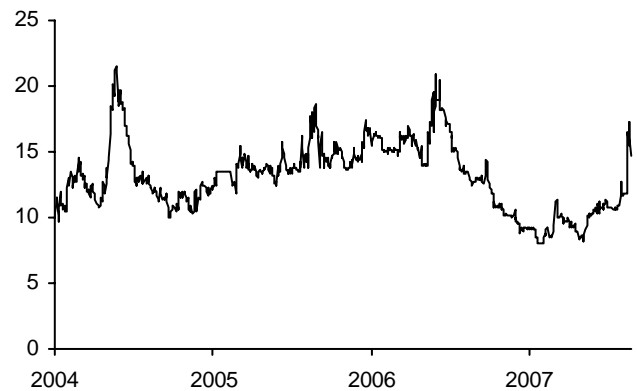
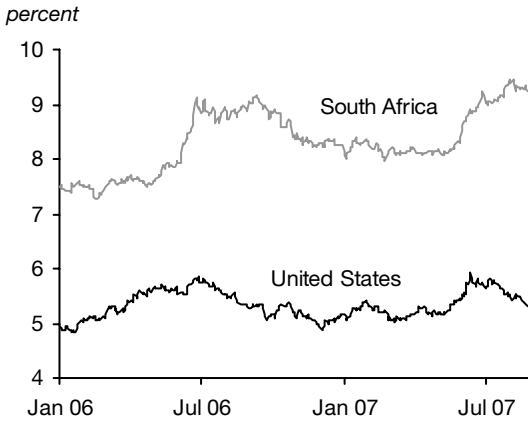
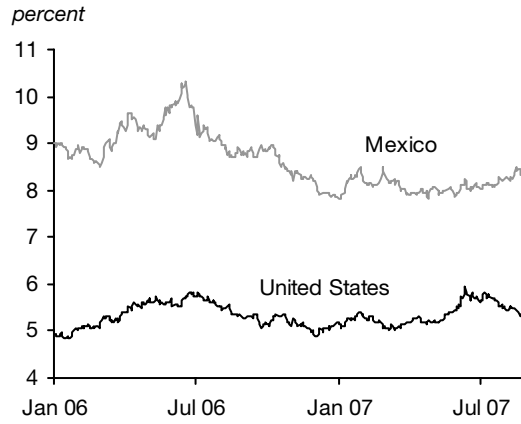


Chart 7: Key local market interest rates

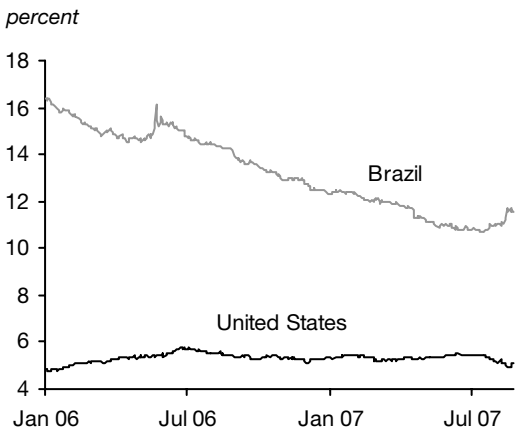
South African and U.S. 10 year swap rates



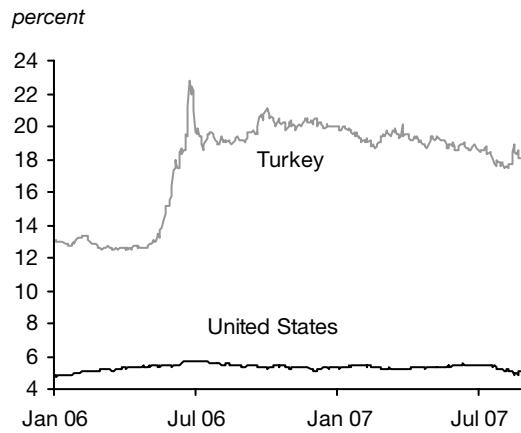
Mexican and U.S. 10 year swap rates



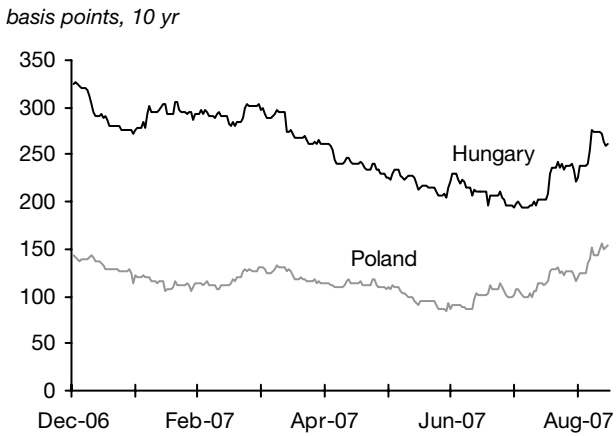
Brazilian and U.S. 1 year swap rates



Turkish and U.S. 1 year swap rates



Hungary and Poland: spreads over bunds



Czech Rep. And Slovakia: spreads over bunds



As U.S. sub-prime mortgage difficulties widened to tighten global liquidity, many emerging local markets began to suffer, however. Emerging market currency risk—as reflected in implied volatilities in the options market—began to rise (see Chart 6, on page 4), and local market interest rates moved higher, at least until the Fed cut its discount rate on August 17th (see Chart 7 on page 5).

While there has thus been some recent spillover from U.S. sub-prime difficulties to local emerging markets, it is impressive that the magnitude has, so far, been somewhat limited. Indeed, the sell-off in key local markets—whether measured by rising rates or by rising currency volatility—so far lags behind various periods in 2005-06.

In view of the magnitudes of some of the recent flows into some high-yielding emerging economies and ongoing global liquidity tension, it would be premature to conclude that these adjustments have so far fully played out. A number of Emerging European countries with large foreign participation in the local bond market (eg. Hungary and Turkey), excessive current account deficits (eg. Romania), or heavy borrowing by local banks (eg. Russia, Ukraine and Kazakhstan) bear watching.

Potential wealth losses by investors from EM countries

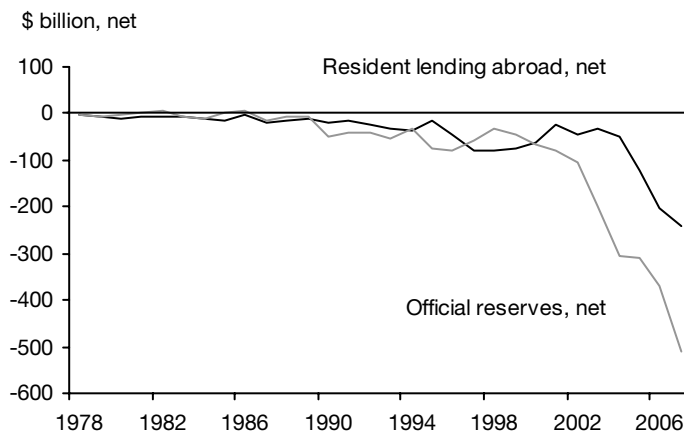
One of the most significant factors roiling global markets in July and August was the recognition that a significant portion of the wealth destruction caused by the leap in sub-prime mortgage defaults, and the consequent plunge in the market value of many U.S. mortgage-related securities, would be borne by foreign investors. Losses and/or funding difficulties have been recognized by financial institutions in Germany, France, the Netherlands, Canada and Australia.

There has been a substantial rise in holdings of external assets accumulated by emerging market economies in recent years in both the public and private sectors. In 2006, an IIF sample of 54 emerging economies accumulated external financial assets of \$575 billion, net (\$371 billion in the form of official reserves, and \$204 billion of other lending flows by both the public and private sectors; Chart 8). On the basis of our current projections (which are subject to considerable uncertainty, given market volatility, especially with regard to the unwinding of carry trades), these are likely to have risen to a combined \$753 billion in 2007.

Public sector asset accumulation has been largely in the form of foreign exchange reserves, and these assets would presumably be mostly invested in high-grade (government)

securities. Since these markets have rallied in recent weeks as there has been a flight to quality, wealth effects from these asset holdings will have been positive, not negative. For some countries, however—especially in Emerging Asia—there has been an emphasis over the past year or so to diversify into higher-yielding investments, and it is possible that some of these funds have found their way into investments linked to assets that have fallen in value in recent weeks.

Chart 8: Foreign asset accumulation by emerging economies



So far, however, there has been a conspicuous absence of news related to losses in U.S. markets registered by investors domiciled in emerging markets. Of course, this might simply reflect less need on the part of such investors to recognize these losses. After all, the greatest difficulties facing foreign institutions with illiquid, hard-to-value U.S. mortgage-related securities have been funding problems. With foreign exchange reserves high and under no pressure, this is not a challenge that official reserve/sovereign wealth fund managers have faced.

Whether or not key emerging market foreign investors have suffered losses to date, it seems likely that the relative riskiness of U.S. assets will have risen for two important reasons. First, recent market turmoil adds to U.S. recession risks. While a U.S. recession would be an unambiguous global negative (and would thus have global asset market implications), the leading edge of any recession, or phase of extended weakness, would be concentrated on U.S. housing and the U.S. financial sector. Second, the problems surrounding the role of the ratings agencies in assessing the underlying default risks of important segments of the fixed income market seems to have undermined somewhat confidence in the transparency of U.S. capital markets. This could well make foreign investors more leery about investing in U.S. fixed income markets other than the Treasury market.

Fixed income markets have been the key vehicle through which the U.S. current account deficit has been financed in recent years. Any portfolio shift away from U.S. assets would inevitably lead to some further dollar depreciation.

Dampening enthusiasm in the global housing finance sector

Housing is a consummate non-tradable, so there are limits through which a downturn in the housing market in one country such as the United States can affect housing in others. One possible direct channel, however, is through financial flows into the housing finance sector.

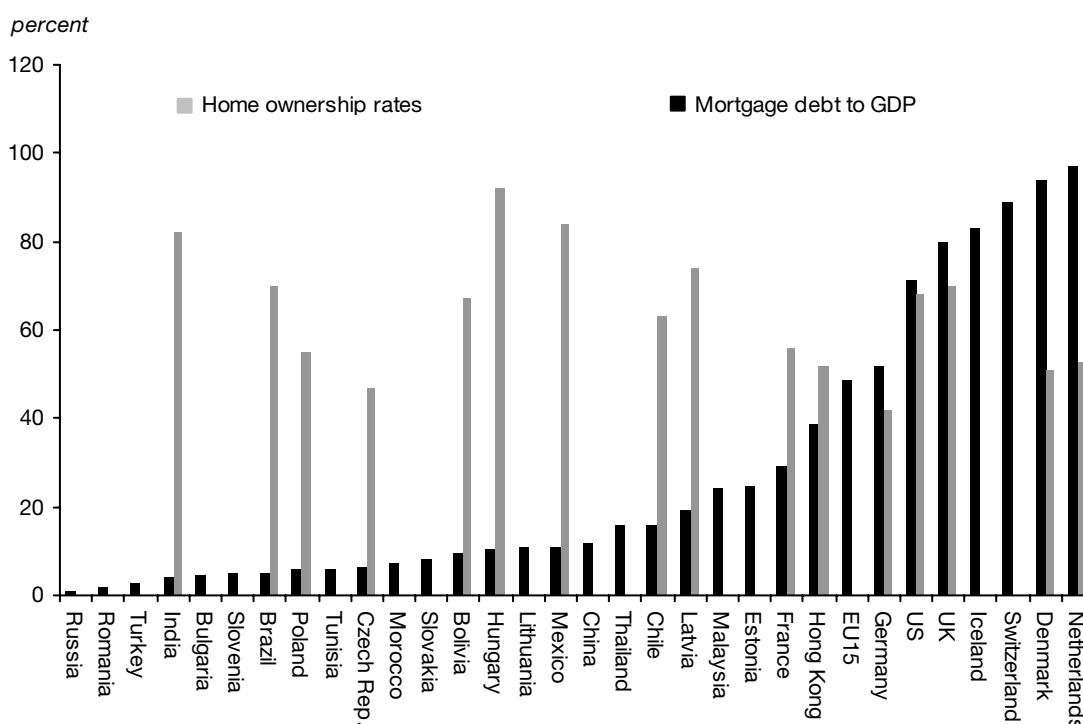
Residential mortgage markets in most emerging markets are relatively small compared to those in high-income countries (Chart 9). But they have been growing rapidly in many emerging market countries as the conditions for a well-functioning mortgage market—macroeconomic stability and appropriate legal structures—are put into place.

There is no inevitability that this rapid growth in mortgage lending in many emerging economies will come to an end, even as mortgage lending to low creditworthy households in the United States slumps. Indeed, healthy local housing market fundamentals should continue to dominate the mortgage market in emerging economies. Not only are house prices rising across many regions of the emerging world, but many emerging economies enjoy relatively high home ownership rates without commensurately high mortgage/GDP ratios, suggesting that there is considerable scope for leverage in EM mortgage markets to rise, at least in the aggregate.

There are, however, a number of aspects of recent emerging market mortgage developments that bear watching:

- Mortgage growth has been explosive across a number of smaller Emerging European economies, especially Estonia, Latvia and Lithuania. Rapid nominal growth in mortgage financing across most of Central and Eastern Europe has helped boost house prices which, in turn, adds further fuel to the fire. It will be interesting to see whether the graphic experiences now playing out in the United States affect the confidence of borrowers and lenders to continue such rapid growth.
- Some of the banks heavily involved in the U.S. mortgage market are also important to the rapid growth of emerging market mortgage debt. In view of the international linkages that have become evident between the U.S. sub-prime market and foreign financial institutions, it is possible that these banks will decide to curtail mortgage risk globally, which could affect the buoyancy of emerging market mortgage markets.
- The U.S. sub-prime crisis has highlighted the dangers inherent in mortgage lending at the risky end of the spectrum (e.g. where monthly payment streams are liable to rise sharply and where the loan-to-value ratio is high). In the light of this experience, it is plausible that all mortgage lenders will turn somewhat more risk-averse. In this context, the foreign-currency mortgage loans that have been popular across parts of Emerging Europe look

Chart 9: Mortgage debt to GDP and home ownership rates



particularly dangerous (see *Strong Credit Expansions Point to Increasing Vulnerabilities*, IIF Special Briefing, June 2007). When credit and capital inflow conditions are favorable, these loans are easy to service: interest payments are very low in local currency terms, and loan to value ratios fall as local currency appreciation reduces the value of the mortgage outstanding and strong house price inflation boosts the value of the collateral. When global capital market shift, however, all these factors go into reverse, adding a potentially de-stabilizing factor to an already difficult situation.

Links driven by underlying growth considerations

In figuring the impact of the U.S. sub-prime turmoil on U.S. and global economic growth, it is important to recognize that the U.S. homebuilding sector peaked almost two years ago. As a result, U.S. housing has already been a drag on growth for six quarters (2006Q1-2007Q2), taking an average of about $\frac{3}{4}$ percentage point off growth over that period. Despite this drag, not only has the U.S. economy managed to grow at a solid 2.4 percent pace (with consumption growth averaging 3.1 percent over this period), but the global economy outside the United States has accelerated impressively to make up ground lost from U.S. housing.

In the past week or so, however, concerns have mounted that financial turmoil is becoming sufficiently serious to exert an additional, potentially severe, hit to global growth. This drag could come from a number of sources: a slumping U.S. consumer; a sudden and severe loss in global business confidence, leading to a drying up in business equipment spending; a rush to dump inventories in an environment where short-term business financing has become far more

challenging. Short-term indicators of business conditions—such as weekly jobless claim data and weekly retail sales data—will come under particular scrutiny in the weeks ahead, as they did in the immediate aftermath of September 11.

If the growth outlook were to deteriorate sharply in the weeks ahead, the hit to emerging market asset prices could come through a number of channels explored above (e.g. lower equity prices, higher spreads, and lower currency values). An additional and important influence, however, would be the link through commodity prices. Indeed, weak real commodity prices (especially a low real oil price) was one way in which the East Asian shock in 1997 was spread around the emerging world in 1998. In the past few quarters, real commodity prices have been strong, on the expectation of continued, solid global growth. In turn, this has lifted the creditworthiness of a wide array of emerging market borrowers in Latin America, the Middle East, the former Soviet Union and Africa. If these commodity price conditions were to reverse, this would be a significant hit to many emerging economies' real incomes, with adverse implications for budget and external balance positions.

In view of the prompt action by G7 policy makers to ring-fence the financial turmoil from the sub-prime crisis, we do not believe that global growth is currently headed into a weak phase. Indeed, U.S. growth rebounded in Q2 (when growth probably exceeded 4 percent). Some hit to U.S. growth in Q3 and Q4 is likely from the current market turmoil. The U.S. economy looks well placed to weather a short-lived moderation from the consumer, however, helped by a financially-solid business sector and strong demand elsewhere.