

Previous issues of the *Global Financial Stability Report* (GFSR) have analyzed and assessed how the global financial system recovered from various shocks, including the bursting of the equity bubble in 2000–01 and the debt crises in a few emerging market (EM) countries. They spelled out in detail how cyclically favorable conditions and structural changes have made financial intermediaries much stronger. The positive assessment contained in the September 2005 GFSR that “the global financial system has yet again gathered strength and resilience” has been validated by recent developments. However, a number of cyclical challenges appear to be gathering on the horizon, which necessitate a more nuanced view of the financial outlook for the remainder of 2006 and beyond.

As this report has argued earlier, globalization and financial innovations have advanced the scope for capital markets to channel credit to various users in the economy. In particular, the emergence of numerous, and often very large, institutional investors and the rapid growth of credit risk transfer instruments have enabled banks to manage their credit risk more actively and to outsource the warehousing of credit risk to a diverse range of investors. A wider dispersion of credit risk has “derisked” the banking sector, which still occupies a strategically important role in the economy, in part because of its role in the payments system. It is widely acknowledged, meanwhile, that holding of credit risk by a diverse multitude of investors increases the ability of the financial system as a whole to absorb potential shocks. This contrasts with a situation where a small number of

systemically important banks bear the brunt of making provisions for nonperforming loans.<sup>1</sup> It is true, as mentioned below, that the details of who holds which risk and in what amount are less transparent outside the banking system because of less stringent reporting requirements. On balance, however, it is the wider dispersion of risks, as such, that increases the shock-absorbing capacity of the financial system. As with a reinsurance system, the risk diversification and dispersion aspects matter more than the precise details of who is the ultimate risk bearer.

Beyond risk diversification, the unbundling and active trading of risk, including through credit derivative markets, seem to have created an efficient, timely, and transparent price discovery process for credit risk. Instead of waiting to learn about the possible deterioration of credit quality through infrequent reports of nonperforming loans on banks’ balance sheets, counterparties in the markets, as well as supervisors, can now monitor indicators of credit quality in real time (see Chapter II). All these structural changes, taken together, have made financial markets more flexible and resilient. As former U.S. Federal Reserve Chairman Alan Greenspan said: “These increasingly complex financial instruments have contributed to the development of a far more flexible, efficient, and hence resilient financial system than the one that existed just a quarter-century ago.”<sup>2</sup>

At the same time, this “brave new world” of modern capital markets creates its own set of risks and challenges. As mentioned above, these include a lower level of information

<sup>1</sup>By way of example, the annual number of U.S. bank failures has fallen to a very low level in the past 10 years—a period that witnessed a number of major shocks that in the past could have caused great anxiety among banks and their supervisors.

<sup>2</sup>See Greenspan (2005).

**Table 1.1. Sectoral Balance Sheets**  
(In percent)

	2000	2001	2002	2003	2004	2005
<b>United States</b>						
Banking: NPL/total loans	1.1	1.4	1.5	1.2	0.9	0.8
Banking: Return on equity	14.8	14.2	14.9	15.2	14.6	13.7
Corporate: Debt/net worth	48.6	51.6	50.8	49.3	47.1	45.5
Household: Net worth/disposable personal income	583.3	543.4	497.6	537.9	555.9	564.9
<b>Europe</b>						
Banking: NPL/total loans	3.0	2.9	3.0	3.0	2.3	...
Banking: Return on equity (after tax)	18.3	11.2	9.0	11.3	14.2	...
Corporate: Debt/equity	67.3	71.3	74.2	72.1	70.3	...
Household: Net worth/assets	85.3	84.6	84.3	84.4	84.3	...
<b>Japan<sup>1</sup></b>						
Banking: NPL/total loans	6.3	8.4	7.4	5.8	4.0	3.5
Banking: Return on equity	-0.5	-14.3	-19.5	-2.7	4.1	6.3
Corporate: Debt/equity (book value)	156.8	156.0	146.1	121.3	121.5	108.2
Household: Net worth/net disposable income	767.5	763.9	753.0	749.0	...	...

Source: National authorities.

Note: NPL = nonperforming loans. Expanded balance sheets and detailed notes may be found in Tables 7–9 of the Statistical Appendix.

<sup>1</sup>Data are for fiscal years beginning April 1. Data on household nonfinancial assets and disposable income are only available through FY2003. Data in FY2005 are for the first half of 2005.

about the distribution of risk to and among the nonbank financial institutions, which increases the potential for unpleasant surprises from the less regulated market segments. More important, this new market-based environment for credit risk is predicated much more on the availability of liquidity in all crucial areas of this market. Any potential liquidity disturbance could amplify market corrections (see Chapter II). In addition, operational risks, such as delays in credit derivative trade confirmations, assignments of contracts to third parties, and contract settlements, have been identified as weaknesses, and remedial actions are being undertaken by market participants to address them.

In the area of emerging market debt, many countries—especially the large and systemically important ones—have substantially improved the structure of their sovereign debt and their domestic capital markets. At the same time, their investor base, both international and domestic, has expanded and become more diverse. All together, these

changes have made EM countries more resilient to external shocks (see Chapter III).

In parallel, cyclical factors have also been very favorable over the past few years. Low interest rates and an abundant supply of liquidity have supported a solid global economic recovery and set in motion a search for yield. Banks and corporations implemented cost-cutting restructurings in response to previous over-leveraging and to competitive pressure more generally. As a result, corporate earnings have recovered strongly in the past three years, and corporate balance sheets have strengthened beyond expectations. Balance sheets of the household sector in major countries have also improved since 2001, because of the rise in house prices and the recovery of international equity markets. For example, net worth of the U.S. household sector has recovered to close to the all-time high reached in 1999 (Table 1.1).<sup>3</sup> Benefiting from these developments, banks in many countries—especially the large internationally active institutions—currently enjoy very strong financial

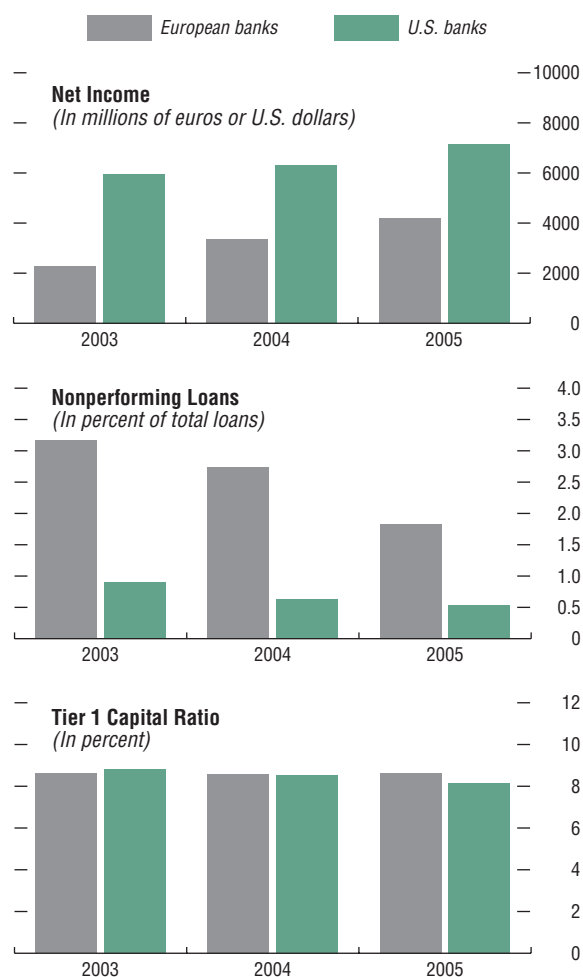
<sup>3</sup>It is also important to note that households face many risks, such as abrupt movements in asset prices, including house prices, that in turn might substantially affect net worth. Their debt service burden would rise as interest rates increase. Households have also taken more responsibility for their future financial needs, including retirement needs.

health: strong capital bases, good profitability, and good asset quality as reflected in their low nonperforming loan ratios (see Figure 1.1 and Box 1.1). All in all, strong balance sheets in the financial, corporate, and household sectors have created substantial financial cushions in practically all major financial systems.

However, these favorable cyclical conditions will not be permanent. At a time when policy interest rates have been raised and credit quality is expected to deteriorate somewhat, a number of questions arise: To what extent, and how fast, will cyclical conditions change? How will that affect asset reallocations and price corrections? How much cushion and support would the aforementioned structural changes in financial systems provide? Given the paucity of data in many areas and the quite recent nature of the underlying structural changes, the answers to these questions will have to be tentative and qualitative in nature. While it would be desirable to apply a “bottom-up approach” by using extensive financial stability indicators, these are either not available or available only with a considerable time lag. As is often the case with developments in financial markets, waiting for conclusive empirical evidence would take very long and would deprive policymakers of the chance to react within a reasonable time span.

Chapter I analyzes the main cyclical risks in the financial markets going forward, especially those stemming from higher interest rates and/or higher inflation, a deterioration in the credit quality of various debtors, and a sudden unwinding of global imbalances. In addition, it highlights a number of policy conclusions. Chapter II discusses developments in the credit derivative and structured credit markets, focusing on the implications for financial stability and on potential influences on credit cycle dynamics. It argues that while these developments have helped to make the banking and overall financial system more resilient, they present new challenges and vulnerabilities that need to be better understood. Chapter III describes changes that have taken place in the

**Figure 1.1. Financial Indicators for U.S. and European Banks**



Source: IMF staff estimates.

### Box 1.1. Financial Systems in Mature and Emerging Markets

#### *Market and Credit Risk Indicators for the Mature Market Financial System*

This issue of the GFSR continues the use of market risk indicators (MRIs) and credit risk indicators (CRIs) to review the evolution of risks in mature financial systems, and expands the scope of the CRI to include insurance companies.<sup>1</sup> During the past year, banking system risk,

Note: The main authors of this box are John Kiff and Yoon Sook Kim.

<sup>1</sup>The MRI index captures institution-specific risks based on the Value-at-Risk (VaR) of portfolios comprised of equities from three groups of institutions: large complex financial institutions (LCFIs), commercial banks, and insurance companies. VaR measures the market capitalization-weighted potential loss over a 10-day period at the 95 percent confidence level of a portfolio of equity securities. The variances and correlations used in the computations are, at each point in time, daily estimates over a 75-day rolling period, and they are obtained using an exponential smoothing technique that gives more weight to the most recent observations. To isolate the risks to the specific institutions in question, we continue to use a methodology suggested by Hawkesby, Marsh, and Stevens (2005) to remove the effects of global and domestic equity market volatility (VaR-beta). The CRI index measures the probability of multiple defaults within the three above-mentioned groups of institutions, implied from the market prices of credit default swaps. The definition of LCFIs is the same as that suggested by Hawkesby, Marsh, and Stevens (2005), and our portfolio comprises ABN Amro, Bank of America, Barclays, BNP Paribas, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC Holdings, JPMorgan Chase & Co., Lehman Brothers, Merrill Lynch, Morgan Stanley, Société Générale, and UBS. The commercial banks captured in the MRI are Australia and New Zealand Banking Group, Banca Intesa, Banco Bilbao Vizcaya Argentaria, Bank of East Asia, Bank of Nova Scotia, CIBC, Commerzbank, Fortis Bank, HVB Group, ING Bank, KBC Bank, Mitsubishi Tokyo Financial, Mizuho Financial, National Australia Bank, Nordea, Royal Bank of Canada, Royal Bank of Scotland, SanPaolo IMI, Santander Hispano Group, Skandinaviska Enskilda Banken, Sumitomo Mitsui Financial, Svenska Handelsbanken, Toronto Dominion, UFJ Holdings, UniCredito, Wachovia, and Westpac Banking Corp. The CRI focuses on a smaller group of such banks for which CDS quotations are available.

as measured by the MRIs and CRIs, has remained relatively low, and does not indicate any particular financial stability concerns, as signaled in the financial markets. Similarly, the insurance company MRIs and CRIs seem to indicate that the property and casualty insurers, and the reinsurers, are sufficiently capitalized and diversified to absorb the catastrophic 2005 hurricane-related losses.

#### *Mature Market MRIs*

Throughout 2005, the VaR-beta for the portfolio of financial institutions fluctuated in fairly narrow bands, suggesting that there have not been any significant changes to the aggregate risk profile of these financial institutions (see first figure). The VaR-beta does rise rather sharply at the end of 2005, but this relates to a sharp rise in equity prices, and not to any apparent financial stability concerns.<sup>2</sup>

During 2005, the VaR-betas for the insurance companies continued to fluctuate in a fairly tight range (see second figure).<sup>3</sup> However, in September and October, the VaR-betas for the reinsurance and the property and casualty companies surged higher in the aftermath of Hurricanes Katrina and Rita. Though the property and casualty insurers' VaR-betas settled down by October, the reinsurers' VaR-betas

<sup>2</sup>As noted in the September 2005 issue of the GFSR, one of the potential flaws in the MRI is that the risk metrics of parametric VaR measures tend to increase with the volatility of the underlying assets, regardless of whether the volatility is associated with price increases or decreases. This and other MRI shortcomings will be addressed as we continue to develop our indicators in future issues of the GFSR.

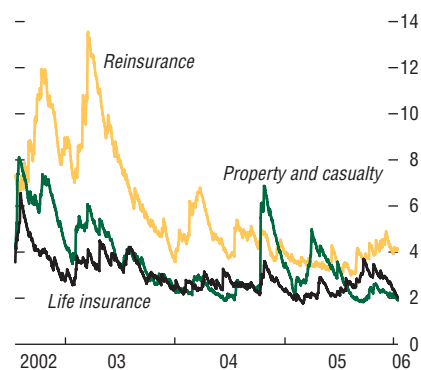
<sup>3</sup>Insurance companies captured in the MRI are Aegon, AIG, Allianz Group, Allstate, Aviva, AXA, Chubb, Friends Provident, Gruppo Generali, Hartford Financial Services Group, MetLife, Millea, Mitsui Sumitomo, Munich Re, Prudential Financial, Prudential PLC, Sampo, Skandia, St Paul, Swiss Re, and Zurich Re. The CRI focuses on 15 insurers for which CDS quotations are available.

**VaR-Betas for Full Portfolio of Financial Institutions**  
(In percent)



Sources: Bloomberg L.P.; and IMF staff estimates.  
Note: LCFIs are large complex financial institutions.

**VaR-Betas for the Insurance Industry**  
(In percent)



Sources: Bloomberg L.P.; and IMF staff estimates.

continued to rise. The global property and casualty insurance and reinsurance industry faced large losses from Katrina.<sup>4</sup> However, the large reinsurers are well capitalized and diversified, and were perceived as able to absorb Katrina-related losses. In fact, some analysts noted that the reinsurers may benefit from a continuation of the strong or rising pricing environment, as a result of the significant hurricane activity during the second half of 2005, and their equity prices generally strengthened through the end of 2005.

**Mature Market CRIs**

The large complex financial institution (LCFI) and commercial bank CRIs indicate that the probability of multiple defaults spiked sharply in May, as the market digested the Ford and GM downgrades, and the related volatility in the structured credit markets (see third

figure).<sup>5</sup> However, since then, default probabilities have declined steadily, showing no discernable reaction to a number of significant defaults (Refco, Delphi, and Calpine) and the continuing deterioration of the health of the U.S. auto sector. In the past, such events may have been expected to impact materially on the financial institutions represented in the MRIs and CRIs. However, it seems that the market perceives that these institutions are less exposed to such event risks, possibly based on better risk management techniques and tools available (see Chapter II).

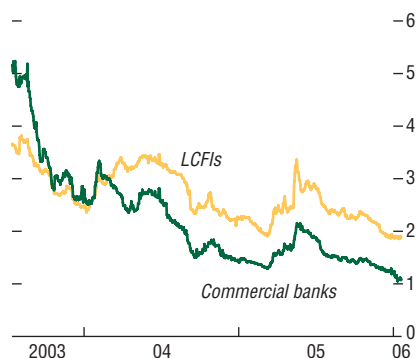
The new insurance company CRIs also followed the same track (downward) since August 2005 (see fourth figure), although there was a

<sup>4</sup>Mitigating some of the losses related to Katrina was the fact that much of the damage was flood related, which is covered by federal flood insurance programs and excluded from most homeowner insurance policies.

<sup>5</sup>See Chapter II of the September 2005 GFSR for more detail on the CRI methodology. Basically, it reflects the probability of multiple defaults over a two-year horizon, as imputed from a portfolio of five-year CDSs referenced to the 15 institutions in the three baskets. The methodology is based on a “structural” model that requires two key inputs, aside from the individual institution risk-neutral default probabilities implied by their CDS price levels: the loss-given-default (45 percent) and interinstitution equity correlation levels (50 percent for LCFIs and 30 percent for the commercial banks and insurance companies).

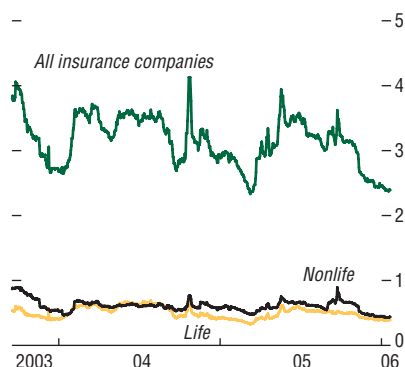
**Box 1.1 (concluded)**

**Probability of More Than One Default Among Portfolio of Financial Institutions**  
(In percent)



Sources: Bloomberg L.P.; and IMF staff estimates.  
Note: LCFIs are large complex financial institutions.

**Probability of More Than One Default Among Portfolio of Insurance Companies<sup>1</sup>**  
(In percent)



Sources: Bloomberg L.P.; and IMF staff estimates.  
<sup>1</sup>The life- and nonlife-specific CRIs are each based on five insurers, whereas the all-insurers CRI is based on 15 insurers, which is why the all-insurers CRI is higher.

September surge in the nonlife-specific (reinsurance, and property and casualty) CRI in the wake of Hurricane Katrina.

**Developments in Emerging Market Banking Systems**

Banking systems in emerging markets have generally strengthened overall as a result of the economic recovery and reforms. However, risks to financial stability may be increasing in some countries because of rapid credit growth and rising real estate prices. Large-scale intermediation of foreign inflows by major banks is contributing to credit expansion and is another source of systemic risk. The situation, however, varies considerably across regions and groups of countries.

In Asia, financial systems seem to have strengthened following banking sector reforms and improved supervision, although problems persist in a few countries where the banking systems still suffer from structural weaknesses. The center of gravity of growth in financial services continues to shift toward the large and rapidly growing economies of India and China. The main risks going forward are the following:

- rapid growth of credit to households in a number of Southeast Asian countries, espe-

cially for mortgages, and of sale to retail customers of complex structured products with limited hedging possibilities;

- the dominance of state-owned banks in India and China, with expanding bank balance sheets in the latter in the context of high nonperforming loans ratios; and
- continued corporate sector lending against the backdrop of weak governance and transparency.

In emerging Europe, rapid credit growth in many countries, especially in Eastern Europe, driven by the expansion of large foreign banks competing for market share, poses the main risk. In addition, intraregional contagion risk has also increased as these banks pursue common credit expansion strategies and are exposed to the same risk factors. The authorities have implemented measures, such as higher reserve requirements and tighter prudential limits, to slow credit growth, but with mixed effects thus far.

In Latin America, performance indicators for the financial systems have improved, including

in countries emerging from financial crises or affected by political turbulence. The favorable trends include sound capital adequacy, sustained expansion of lending activity, rising profitability, and better asset quality. Financial markets performed well, as illustrated by the strong performance of stock prices, narrowing of sovereign debt spreads, and upgrades of sovereign credit ratings.

In the Middle East, Central Asia, and Africa, high commodity prices are the main factors driving developments. In oil-producing countries, high oil prices are supporting strong economic activity and inflation of asset prices. The main risks stem from rapid credit growth in combination with rising asset prices, low transparency, and political uncertainty in some countries. A

sharp reversal in oil prices could have adverse effects on the financial systems in some of these countries. The financial systems of sub-Saharan African countries have mostly continued to strengthen, supported by strong economic growth and enhanced regulatory frameworks, but fragilities persist. Sociopolitical instability coupled with weaknesses in the enforcement of prudential frameworks accounted for much of the deterioration in the banking systems in parts of the West African Economic and Monetary Union and *Communauté Economique et Monétaire de l'Afrique Centrale* regions. More generally, the current high levels of excess liquidity coupled with the high nonperforming assets in most sub-Saharan countries are sources of vulnerability.

composition of emerging market countries' sovereign debt and investor base, and gauges how these changes affect resilience to adverse shocks. It shows that the EM investor base is becoming more diversified, with more long-term-oriented investors in both domestic and external debt markets and more foreign investors willing to invest in local currency EM debt. Active debt management and development of local debt markets in several large EM countries have contributed significantly to these positive results.

### Possible Cyclical Challenges Facing Financial Markets

Cyclical developments, such as higher interest rates and the turning of the credit cycle, are likely to present a number of challenges to financial markets and institutions. The benign financial environment to date described above has reduced credit risk premiums and financial volatility (Figures 1.2 and 1.3). Term risk premiums (for long-term government bonds)

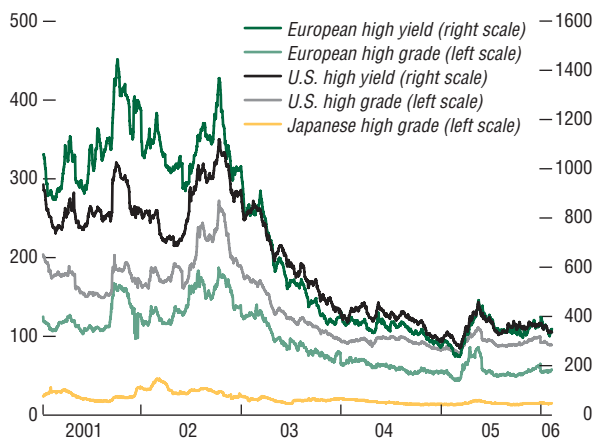
have also been low in major countries. The low level of risk premiums is open to different interpretations—either the actual risks embedded in financial instruments have declined or investors' risk appetite has increased, leading them to bid risk premiums down. In the former case, the more stable macroeconomic climate in the United States and the global economy since the mid-1980s could explain some of the decline in risk premiums.<sup>4</sup> In the latter case, such investor behavior could lead to a mispricing or underpricing of risk, which then might lead to abrupt corrections. The analysis in Box 1.2 (p. 10) suggests that there is no solid evidence of a systemic underpricing of risk because of a change in investors' risk preferences. However, as cyclical conditions become less favorable, volatility and ultimately risk premiums could increase.

### Interest Rate and Inflation Risks

The recent rise in short-term interest rates has created a flat and, at times, mildly

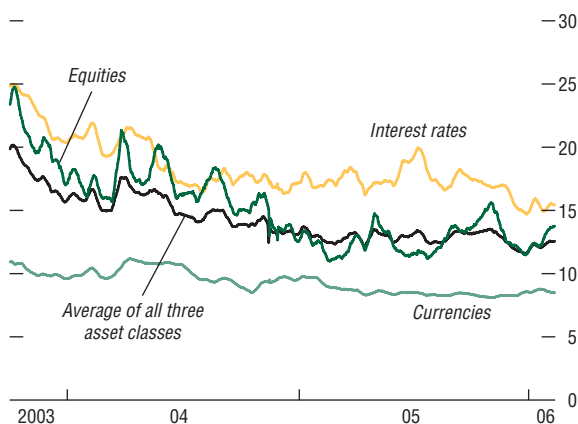
<sup>4</sup>See Ferguson (2005) and Bernanke (2006).

**Figure 1.2. Corporate Spreads**  
(In basis points)



Source: Merrill Lynch.

**Figure 1.3. Implied Volatilities**  
(In percent)



Sources: Bloomberg L.P.; and IMF staff estimates.

inverted yield curve in the United States and, to a lesser degree, in other major currency areas. There are some concerns that such a flat yield curve environment could be a harbinger of slowing economic growth in the year ahead. In the past, an inverted yield curve in the United States has been a reasonably good, but not always accurate, forward indicator of recessions to come. This time, a number of factors suggest that a flat yield curve does not necessarily herald recession—in particular, the still-low levels of real interest rates and well-anchored inflationary expectations that lessen the need for aggressive monetary tightening (see Box 1.3, p. 13, for a detailed discussion of the implications of the flattening and possible inversion of the yield curve).

As reflected by the moderate differentials between nominal and inflation-linked government bond yields, inflationary expectations in financial markets are currently still well anchored (Figure 1.4). By the same token, market participants currently expect only mild and mixed movements in short-term rates in the year ahead. Interest rate futures markets currently show that U.K. short-term rates are expected to continue falling gently, U.S. rates are expected to rise modestly before declining later this year, while euro and Japanese rates are expected to rise modestly (Figure 1.5).<sup>5</sup> Consequently, most yield curves are expected to remain essentially flat, and not become inverted to any significant degree and for any sustained period. So far, a flat yield curve has not caused difficulties for U.S.-based financial intermediaries. Reported financial results for 2005 indicate continued strong profitability by banks. Owing to a more diversified business mix, they have been able to remain very profitable. By contrast, in the past, flat yield curves reduced the earnings power and threatened the health of many of those banks whose busi-

<sup>5</sup>Japanese policy rates are expected to stay at current levels and to rise modestly much later this year, following the Bank of Japan's decision to exit its quantitative easing policy.



**Table 1.2. Equity Valuations**

	Price-Earnings Ratios		
	January 2006	1996–2005 average	1970–2005 average
Germany	17.5	25.6	18.2
Japan	23.6	27.2	31.1
United Kingdom	13.9	17.8	13.4
United States	18.6	24.1	16.6
Developed Europe	15.3	20.3	...
Emerging markets	15.0	16.6	...

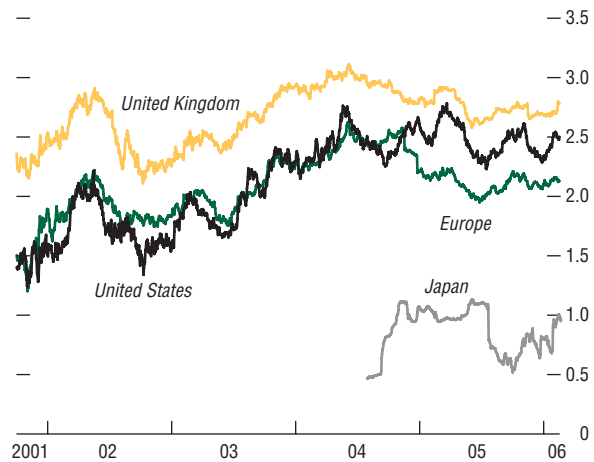
Source: Morgan Stanley Capital International.

ness models were based much more on maturity mismatches.

However, if inflation expectations, for whatever reasons, including further rises in oil prices, were to increase significantly for a sustained period of time, this would create headwinds in financial markets through several channels.

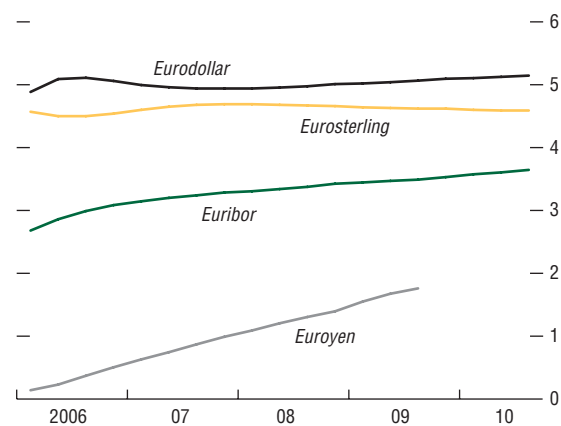
- A general rise in short- and long-term interest rates would most likely lead to an economic slowdown, with negative consequences for corporate earnings and credit quality, and credit spreads would widen substantially.
- Bond portfolios would incur substantial valuation losses for both domestic and international investors. Institutional investors, such as pension funds and life insurance companies, might also experience mark-to-market losses in the near term. However, their balance sheets could improve in the medium term as the present value of their liabilities falls and they invest new pension plan contributions or insurance premium income in higher-yielding fixed-income instruments.
- Equity markets would come under pressure, especially since earnings growth in many markets has already been expected to decline, albeit from strong and double-digit rates in the past few years. However, any market correction is unlikely to be very significant given that market valuations, measured by price-earnings ratios, are currently at around their long-term averages in most countries (Table 1.2)—meaning, they are

**Figure 1.4. Ten-Year Inflation Expectations**  
(In percent; nominal yields less inflation-indexed yields)



Source: Bloomberg L.P.

**Figure 1.5. Short-Term Interest Rate Expectations**  
(In percent; term structure of three-month LIBOR futures rates, as of February 10, 2006)



Source: Bloomberg L.P.

### Box 1.2. Is the Market Underpricing Risk?

There is a widely held view that investors' appetite for risk has increased over the past few years, leading to higher prices for risky assets and narrower spreads on credit and other risky products. Investors appear to have shifted to more traditionally risky assets, including emerging market equities, while leverage has risen in structured loan and LBO markets, and flows into hedge funds have accelerated. Low interest rates and abundant liquidity have been attributed to this behavior, as market participants confronted with low rates on relatively safe assets have moved toward riskier assets in a search for yield.

Based on this assessment, some market practitioners and public policymakers have cautioned that such behavior could have resulted in a mispricing or underpricing of risk. And, in fact, there is good evidence that risk premiums for credit products are quite low on a historical basis, making such products potentially vulnerable to a cyclical shift in volatility. However, the analysis here suggests that investors' overall attitude toward risk appears not to have changed appreciably, although relative price movements may indicate shifting perceptions of the relative riskiness of specific asset classes.

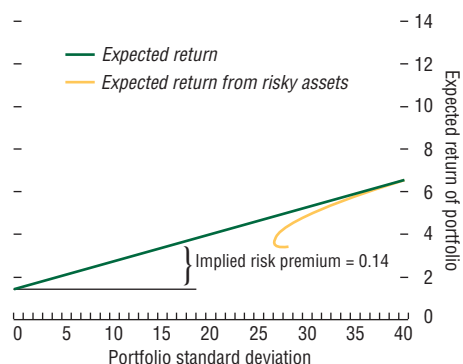
#### Analysis of Market Premiums and Portfolio Developments

To evaluate the overall market risk premium, a simplified version of the capital asset pricing model is employed, with risk-return trade-offs computed for the basket of risky assets alone, and then for the risky basket plus the safe asset.<sup>1</sup>

Note: The main author of this box is Chris Walker.

<sup>1</sup>For each asset, the expected return is the contemporaneous market yield on the asset. This is the earnings yield for equities, the yield adjusted for expected default for bonds, and long-run historical returns for commodities and real estate. Variance and covariances with other asset classes are based on performance over the most recent three-year period. The safe rate is the U.S. Fed funds target rate at the time. Risky assets are U.S., European, Japanese, and emerging market equities; emerging market sovereign bonds; a commodities index; an index for U.S. real estate; and a high-yield bond index.

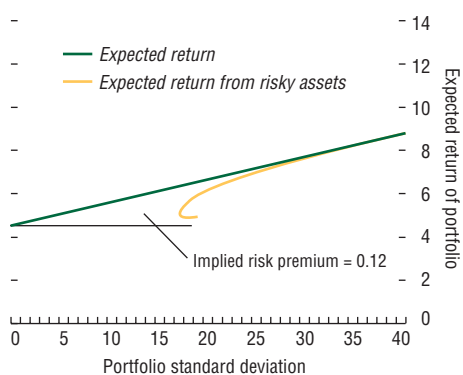
#### Investment Possibilities, January 2003 (In percent)



Sources: Bloomberg L.P.; and IMF staff estimates.

Three points of comparison are taken—2000 when the stock market was near its highs and the Fed funds rate was near current levels, 2003 when the Fed funds rate was near its lowest level of 1 percent, and January 2006 with the Fed funds rate having risen to 4.5 percent. The change in the market risk premium over the three periods is moderate—a small reduction in the expected return-risk ratio from .15 to .14, followed by a decline

#### Investment Possibilities, January 2006 (In percent)



Sources: Bloomberg L.P.; and IMF staff estimates.

to .12 (see first and second figures).<sup>2</sup> However, the overall stability of the risk premium masked a number of changes that may have occurred.

For most fixed-income assets, spreads have fallen to the low side of historical ranges and, in some cases, are close to historical lows. In 2003, most of the high returns to risky assets were attributable to the high yields then available on sovereign emerging debt and corporate bonds.<sup>3</sup> Since then, the EMBIG spread index for emerging market bonds has fallen from 650 basis points to about 200 basis points. The spreads for high-yield corporate bonds have declined by a similar margin, from an average of about 500 basis points to 150 basis points. Furthermore, spreads on such assets, which typically have durations of several years, have fallen even further relative to short-term rates, since term premiums (the difference between long-term and short-term yields) have dropped sharply.

However, expected returns have not declined for all major asset classes. Equity earnings yields—the ratio of earnings to share price—are within their historical range, both in absolute terms and as a spread to the risk-free interest rate. For example, the average earnings yield for the S&P 500 has increased from about 4 percent in January 2003 to about 7 percent at present. Some analysts attribute the apparent unpopularity of equities to the lingering effects of the tech share-led crash of 2000–01. Others argue that recent structural changes, such as new accounting standards for insurance companies and pension funds, may have induced a relative shift from equities to bonds.

<sup>2</sup>The best risk premium available at each time to an investor able to choose among different assets can be determined by the angle of the straight line (the “capital market line”), which expresses the ratio of expected return to one standard deviation in the return. This is also known as the Sharpe ratio.

<sup>3</sup>These yields do not constitute pure expected excess returns, insofar as some share of the yield matches the risk-neutral expected loss. That is, investors effectively use some of the excess yield to provision against expected default. The analysis attempts to compensate for this bias by adjusting for the realized default over the period in the calculation of risk premiums.

### Excess Returns, Volatility, and Risk Premiums (In percent)

	S&P 500	DAX	Emerging Market Equities	Emerging Market Bonds	Com- modities
Excess returns					
January 2000	n.a.	n.a.	4.00	3.71	n.a.
January 2003	2.75	2.75	3.00	4.72	3.02
January 2006	2.70	3.00	3.83	2.10	n.a.
Price volatility					
January 2000	58.7	65.0	115.1	80.9	71.8
January 2003	65.6	67.5	81.9	38.5	72.5
January 2006	31.1	38.9	57.2	26.0	82.5
Risk premiums					
January 2000	0.00	0.00	0.04	0.05	0.00
January 2003	0.04	0.04	0.04	0.12	0.02
January 2006	0.09	0.08	0.07	0.08	0.00

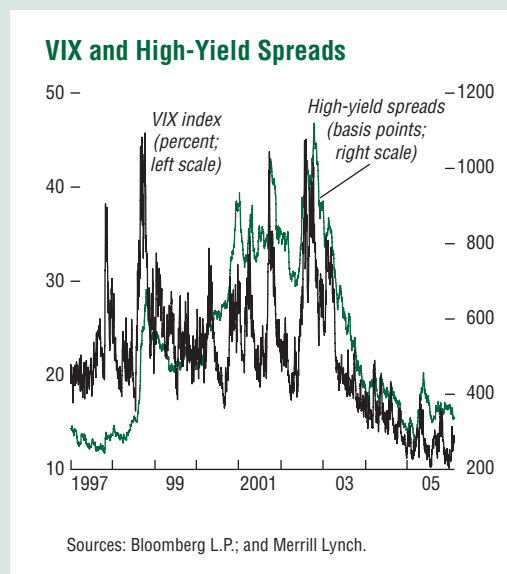
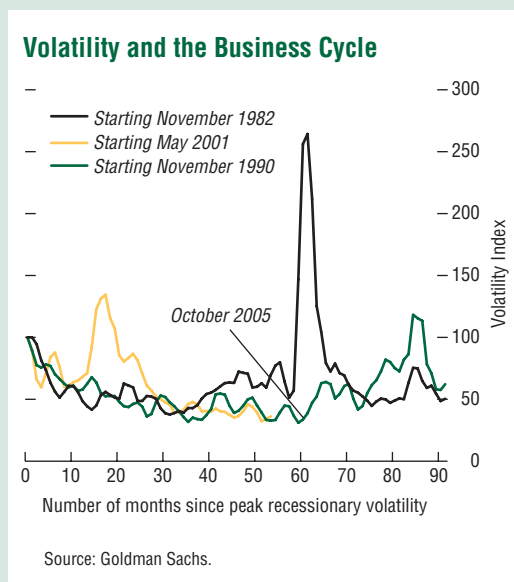
Sources: Bloomberg L.P.; JPMorgan Chase & Co; Morgan Stanley Capital International; and IMF staff estimates.

Note: Expected excess returns are computed as spreads in percent to the risk-free rate for fixed-income instruments (adjusted for default) and earnings yield minus risk-free rate for equities. Volatilities are expressed as standard deviation in annualized one-month returns. Individual risk premiums are calculated as the ratio of excess returns to one standard deviation in returns.

Volatilities—a measure of the riskiness of assets—have dropped across a wide range of assets, in some cases to historically low levels. This is true both for realized volatilities and for the expected volatilities implied by options prices. The standard deviations of returns for corporate bonds, equities, commodities, and foreign exchange have all dropped, as indicated in the middle section of the table above. For many assets, recent observed volatilities (measured as the standard deviation of the daily change in yield) are in the lowest one-quarter of the historical distribution. In the equity market, the widely used VIX index of implied volatility derived from the pricing of options on S&P 500 stocks is at a 10-year low, and is at less than half of its 10-year average. When measured in the aggregate, the trend toward lower volatility is even more pronounced. While correlations among returns from different asset classes have not changed substantially, volatility cycles appear to have become synchronized across asset markets.<sup>4</sup>

<sup>4</sup>This has clearly not always been the case. For example, when bond market volatility peaked in 1994, equity volatility was quite low.

**Box 1.2 (concluded)**



Reflecting the changing pattern of expected excess returns, the components of the “optimal risky portfolio”<sup>5</sup> have shifted from a basket consisting only of emerging market and corporate debt to one now containing a mix of emerging market debt, corporate debt, emerging market equities, and U.S. equities.

Looking only at the change in spread, it may be tempting to conclude that risk aversion has fallen, or that the appetite for risk has grown. But, to the extent that volatilities have declined, and are expected to remain low, risk premiums—computed as the ratio of expected returns to realized volatility—suggest a more nuanced scenario. On an individual asset basis, risk premiums have fallen for higher-yielding fixed-income instruments, as illustrated in the bottom block of the table. At the same time, however, risk premiums have risen quite sharply for equities. This has left the overall premium for market risk little changed.

<sup>5</sup>In the standard capital asset pricing model, this is the portfolio corresponding to the point of tangency between the two frontiers. Whatever their risk preference, investors optimizing the risk-return trade-off hold some weighted combination of this optimal risky portfolio and the safe asset.

**What Are the Risks of a Market Correction in the Price of Risky Assets?**

The analysis has questioned the idea that there has been a systemic mispricing of risk due to a change in investors’ risk preferences. Nevertheless, there is some evidence that volatility may have a large cyclical component,<sup>6</sup> suggesting that declines in asset price volatility may prove less permanent than markets appear to expect. The cyclical view holds that price volatility is low when the economy is running below capacity but picks up as aggregate supply becomes more inelastic and the range of possible outcomes for inflation and asset prices widens. This is typically reflected in a rise in asset price volatility, particularly for equity prices, as illustrated in the third figure (above left). Accordingly, as the economic cycle continues to mature, volatility may rise, prompting investors to shift out of risky assets and causing the prices of those assets to adjust downward somewhat to compensate. The credit risk premium may be the most susceptible to adjustment, particularly in view of the high correlation between equity volatility and credit spreads, as represented in the fourth figure (above right).

<sup>6</sup>See Goldman Sachs (2005).

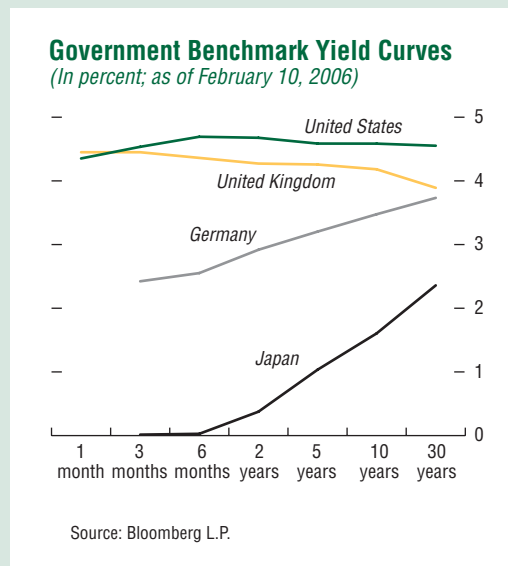
### Box 1.3. Flattening and Inversion of the Yield Curve: Implications and Outlook

Market attention has focused on the U.S. yield curve, which first inverted briefly (when measured at 10-year less 2-year maturities) for a few basis points around year-end 2005 and has since then remained essentially flat or mildly inverted across much of the term structure. This flattening phenomenon has not been confined to the United States, as some other mature markets have experienced similar developments to varying degrees. In the euro area, spreads between short- and long-dated maturities have tightened in recent months, but not nearly to the extent seen in the United States. In the United Kingdom, the yield curve has remained both flat and mildly inverted for some time, while Japan's term structure reflects an accommodative monetary policy (see first figure above).

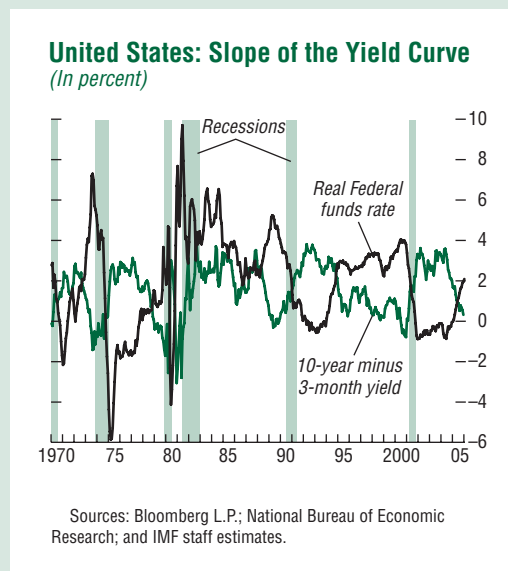
Because an inversion of a yield curve has often been a good forward indicator of recessions in the past, some market participants have expressed a concern that markets are signaling a significant slowdown in the United States. Indeed, the U.S. curve inverted before all of its six recessions since 1960, most recently in August 2000, just ahead of the March 2001 downturn; a disappointing reading on fourth quarter GDP has only added to these concerns (see second figure below). In Germany, an inverted curve has also historically been a forward indicator of recession, but there the record is not as clear. While spreads between short- and long-term rates have narrowed considerably since peaking in early 2004, the German yield curve still retains a positive slope (see third figure).

There are several reasons to suggest why concerns of an impending recession in the United States may be overstated, and why the recent environment is the result of other causes. First, historically, recessions generally have been preceded by a steep and prolonged inversion. During past periods, the yield curve inverted to an average peak of more than 150 basis points and the average length of the inversion was over

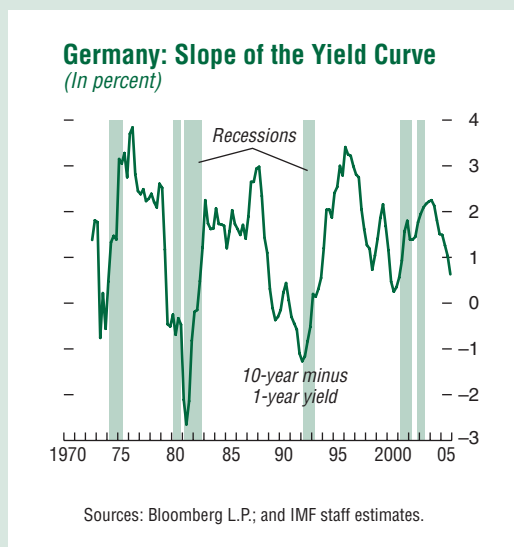
Note: The main authors of this box are Peter Dattels and Ned Rumpeltin.



one year (see first table). Such inversions were an indicator of a recession on average about 11 months in advance. In contrast, the recent inversion was minimal and short lived, and the yield curve is expected to remain essentially flat in the period ahead (10-year less 2-year). Furthermore, despite fears about inversion, most economic activity indicators and consensus forecasts are pointing to sustained economic expansion



**Box 1.3 (continued)**



sion. In particular, the OECD’s index of leading indicators for the United States signaled that economic activity accelerated throughout the second half of 2005. In the inversion episodes that led to a recession, this indicator deteriorated markedly in the months prior to a downturn.

Second, past inversions—and subsequent recessions—occurred mainly because of the degree of monetary tightening needed to bring inflation under control. In the United States, this has typically taken a real Fed funds rate of more than 4 percent to push the economy into

recession. The present situation is different. By raising the Fed funds target rate from 1 percent to 4.5 percent, the policy rate is within a range considered neutral, neither stimulating nor inhibiting growth, with real Fed funds rates much lower than the previous flattenings at about 2 percent.

Third, the factors behind the flattening of the yield curve have changed, implying that a slightly inverted yield curve may be a less negative signal than in the past:

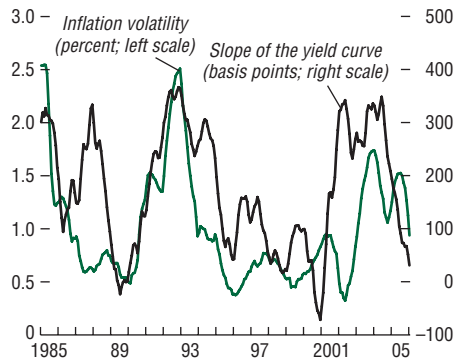
- Yield curve term premiums have diminished as investors no longer demand as much compensation for risks of volatile or unexpected inflation. Changes in realized inflation volatility can often have a profound impact on term premiums, given the particular sensitivity of fixed-income investors to changes in the price level (see fourth figure). Improved policy transparency and central bank credibility, particularly at the U.S. Federal Reserve, have contributed to lower and more stable inflation and better anchored inflationary expectations.
- Yields at the longer end of the curve have also been influenced by rising demand for longer-term securities from several distinct investor classes (see September 2005 GFSR). Notably, pension funds and insurance companies have been active purchasers of longer-duration assets, following changes in accounting stan-

**History of Yield Curve Inversions and Recessions in the United States**

Start of Yield Curve Inversion <sup>1</sup>	Length of Inversion Period (In months)	Inversion Trough (In basis points)	Was the Fed Tightening?	Did Recession Follow?	Lead Time to Recession (In months)
January 1966	1	-3	Yes	No	...
September 1966	5	-39	Yes	No	...
December 1968	14	-42	Yes	Yes	12
June 1973	15	-179	Yes	Yes	5
November 1978	17	-279	Yes	Yes	25
October 1980	11	-357	Yes	Yes	9
July 1989	14	-3	Yes	Yes	11
August 2000	5	-63	Yes	Yes	7
Average	10	-121			11.5
Average (pre-recession)	13	-154			11.4
Median	13	-53			10

Sources: Board of Governors of the Federal Reserve System; National Bureau of Economic Research; and IMF staff estimates.  
<sup>1</sup>Inversion computed using a 5-day moving average of the spread between 3-month bills and 10-year U.S. treasury notes.

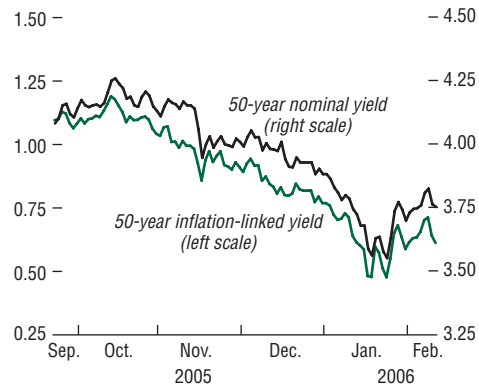
### Inflation Volatility of the United States and Slope of the Yield Curve (3-month moving averages)



Sources: Bloomberg L.P.; and IMF staff estimates.

Note: Inflation volatility is defined as the annualized 24-month rolling standard deviation of yoy core CPI growth, while the slope of the yield curve is the yield spread between 10-year treasury notes and 3-month treasury bills.

### United Kingdom: Ultra-Long Gilt Yields: Nominal and Inflation Linked (In percent)



Sources: Bloomberg L.P.; and IMF staff estimates.

dards and government regulations, that have induced these institutions to minimize the “mismatches” between the duration of their assets and liabilities. Thus, they have started to shift portfolio allocations from equities to fixed-income assets, particularly those with maturities that more closely match the increasingly long maturities of their liabilities.

This is particularly the case in Europe, where pension reform is more advanced than in the United States, and increasing demand for bonds with ultralong maturities has driven

### Slope of the Yield Curve as a Recession Forward Indicator

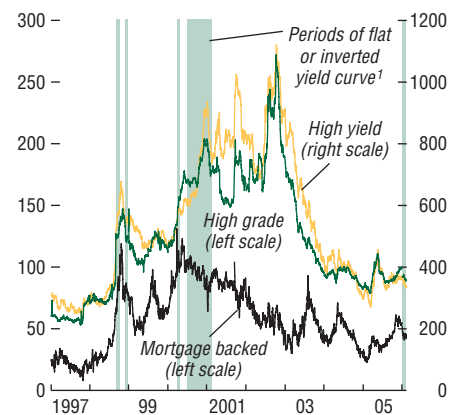
	1954–87	1988–2005
Constant	0.394799 [1.782]	0.248361 [0.775]
Yield curve slope ( $T - 4$ ) <sup>1</sup>	0.50016 [2.940]	0.866319 [0.881]
Real GDP growth ( $T - 1$ )	0.7333	0.080028
$R^2$	0.728073	0.786503
Standard error of regression	1.495832	0.670346
Durbin-Watson	1.163819	1.404759

Source: IMF staff estimates.

Note: Percentage statistics are in brackets and are calculated using Newey-West standard errors; the dependent variable is real GDP growth (year-on-year, in percent).

<sup>1</sup>Spread between 10-year and 3-month U.S. treasury instruments.

### U.S. Credit Spreads and Slope of the Yield Curve (Option-adjusted spreads; in basis points)



Sources: Bloomberg L.P.; and Merrill Lynch.

<sup>1</sup>Defined as a period when the spread between 10-year and 3-month U.S. treasury instruments is less than 10 basis points.

**Box 1.3 (concluded)**

nominal and real yields to very low levels (see fifth figure).

Fourth, recycling of emerging market balance of payment surpluses, including, particularly, in the last year, petrodollars into U.S. financial assets, has led to sustained demand for dollar-denominated assets. At the same time, supply of corporate debt securities has been low, reflecting low world investment levels. These factors have given rise to what appears to be almost a “scarcity premium” for longer-duration assets (see Box 1.6).

The structural changes and differences in cyclical developments may have reduced the predictive powers of the yield curve as a predictor of economic conditions, as suggested by empirical evidence. Prior to 1988, the slope of the yield curve was a statistically significant

indicator of future economic performance. Since that time, however, the same can no longer be said, as the significance of a yield curve flattening has deteriorated significantly (see second table).

The flattening of the yield curve is often consistent with the prospect of a turn in the credit cycle. Spreads of investment-grade, high-yield credits and mortgage-backed securities tend to widen during inversions that come ahead of cyclical turning points. At this turn, spreads on asset-backed securities appear to have widened somewhat earlier, possibly reflecting some uncertainty ahead regarding marginal borrowers in the mortgage markets, while corporate spreads saw some widening in 2005 associated with developments in the U.S. auto sector (see sixth figure).

not as stretched as they were in 2000 and are therefore less vulnerable to a “bursting of the bubble.”<sup>6</sup>

Under these circumstances, financial intermediaries would be stressed by a combination of losses, and their currently strong balance sheets would be tested. At present, market participants expect this to be a rather remote risk, but it bears watching as the consequences for financial markets can be serious.

**Turning of the Credit Cycle: Impact on Corporate Credit Markets**

The credit cycle refers to fluctuations in the financial health or the balance sheet quality of the corporate sector that affect firms’ access

to, and cost of, credit. Variations in average corporate credit quality give rise to the need to write down credit spread products and adjust credit provisions by banks and other holders of credit risk. These statements also apply to the household sector, or to any borrowers on capital markets. Historically, a turning of the credit cycle against the backdrop of low risk premiums is a normal cyclical development. While the credit cycle cannot be observed directly, there are different metrics to gauge it—such as (1) changes in credit spreads in the corporate bond and credit derivative markets, (2) changes in the difference between the number of credit upgrades and downgrades and the default rates,<sup>7</sup> (3) changes in credit standards used by com-

<sup>6</sup>The exceptions to the above assessment are the Middle East equity markets. These markets have rallied sharply in the past two years. The overall market capitalization of the six stock exchanges in the Gulf region has more than doubled in the past year to slightly more than \$1 trillion. Average price-earnings ratios for these exchanges have reached 30–40. The rapid rise of these markets has been driven by the substantial oil price windfall, a portion of which has been invested within the region. Local banks have been actively involved in providing brokerage services to individual investors in these equity markets. The swift rise of these markets, based on a relatively small number of listed companies, harbors risk of a substantial correction—with potentially detrimental effects felt throughout the banking system in the region.

<sup>7</sup>Ratio of the value of defaulted bonds to the value of all outstanding bonds.



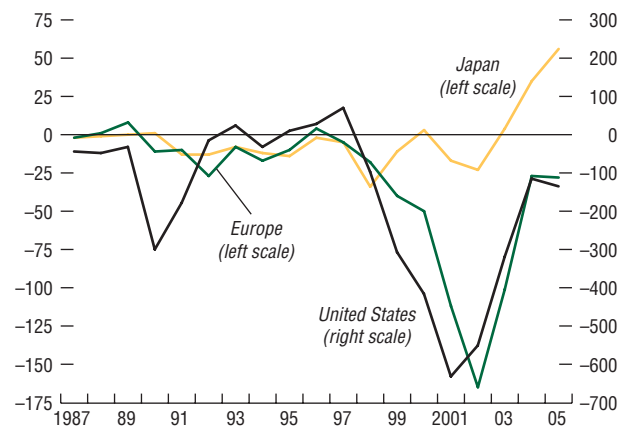
mercial loan officers, (4) changes in the volume of credit flowing to the corporate sector, and (5) changes in the quality of corporate balance sheets.

Only credit spreads are readily available in real time and cover an ever-widening array of individual names. While it is true that changes in credit spreads reflect only a collective market assessment of credit quality, there are no better or more timely indicators that are widely available to market participants. Chapter II explains why and how movements in credit spreads can serve as an early indicator of changes in credit quality and thus credit cycles.<sup>8</sup> Indeed, Figure 1.2 shows that corporate bond spreads have begun to widen since the second quarter of 2005, providing an early sign of a turning of the credit cycle.

The differences between the number of credit upgrades and downgrades and default rates of various segments of the U.S., European, and Japanese corporate bond markets are available, but they are not as timely as credit spreads. The major rating agencies have reported that the number of upgrades minus downgrades is peaking in U.S. and European bond markets but continues to improve in Japan (Figure 1.6).<sup>9</sup> They expect the differences to decline in the future. They also expect default rates to rise moderately from historically low levels. In particular, the rate of default in the U.S. high-yield bond market is expected to increase to 2.0–3.5 percent this year, and to almost double in 2007 to 4.5–5.0 percent.

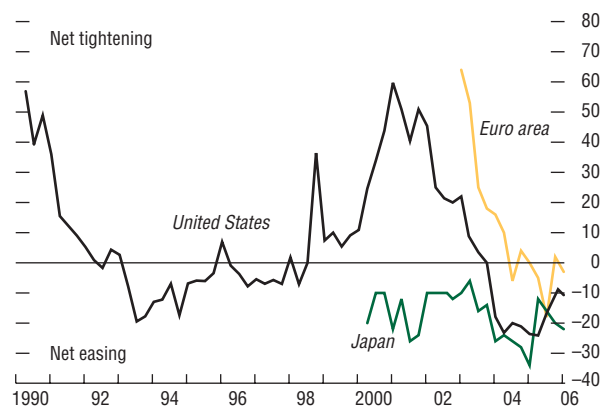
The tightening or loosening of credit standards as constructed from surveys of senior loan officers has usually preceded changes in commercial loan growth.<sup>10</sup> Figure 1.7 shows that bank loan officers have begun to tenta-

**Figure 1.6. Corporate Upgrade Minus Corporate Downgrade Actions**



Source: Standard & Poor's.

**Figure 1.7. Bank Lending Standards from Surveys of Loan Officers (In percent)**



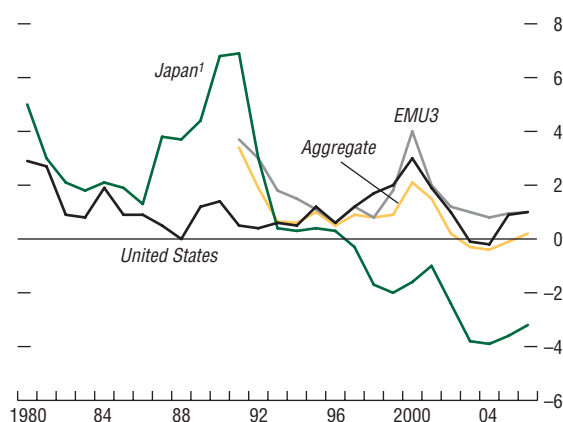
Sources: Bank of Japan; Board of Governors of the U.S. Federal Reserve System; European Central Bank; and IMF staff estimates.

<sup>8</sup>See Zhu (2004) for a comparison of credit spreads between the bond market and the credit default swap (CDS) market.

<sup>9</sup>See Hull, Predescu, and White (2004) for a discussion of the relationship between CDS spreads, bond yields, and credit rating announcements.

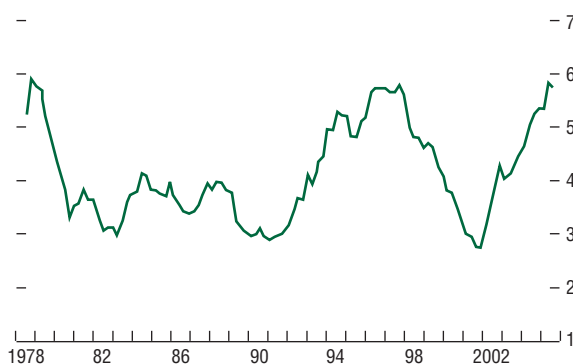
<sup>10</sup>See Lown and Morgan (2004).

**Figure 1.8. Nonfinancial Corporate Financing Gap**  
(In percent of GDP)



Sources: Goldman Sachs; and IMF staff estimates.  
<sup>1</sup>Fiscal year.

**Figure 1.9. U.S. Corporate Sector Earnings Interest Coverage Ratio**



Source: Credit Suisse First Boston.

tively tighten lending standards in the United States and, more recently, in the euro area.

If available in a timely manner, credit flows should clearly be an important indicator. Unfortunately, data on such flows are released only after a long lag—for example, as of mid-February 2006, the U.S. Flow of Funds data were available only for the third quarter of 2005 (although some component data are available with shorter time lags). As such, flow data can explain a past credit crunch but they do not lend themselves to forecasting a change in credit quality.

Last but not least, changes in the quality of corporate balance sheets can also signal a turn in the credit cycle. Though, yet again, balance sheets can be analyzed in detail only with a considerable time lag. The level of provisioning in the balance sheets of commercial banks is a good indicator, but it is also available with a time lag. As a result, to arrive at a plausible assessment at an earlier stage, it is indispensable to look at some qualitative indicators on the health of corporate balance sheets. Listed below are several developments that typically indicate a deterioration of corporate credit quality, that is, that the credit cycle is turning—they corroborate the evidence from credit spread widening, early signs of falling differences between upgrades and downgrades and rising default rates, and a possible tightening of lending standards mentioned earlier.

In the past year or two, a number of corporations have begun to reverse course in strengthening their balance sheets. As mentioned in previous issues of the GFSR, the corporate sector in many countries, most notably the United States, European countries, and Japan, have significantly strengthened their balance sheets since 2001, reflected in their historically strong financial positions (Figure 1.8).<sup>11</sup> Their ability to serv-

<sup>11</sup>For a detailed discussion of the net lending positions of corporations in major countries, see IMF (2006, Chapter IV).

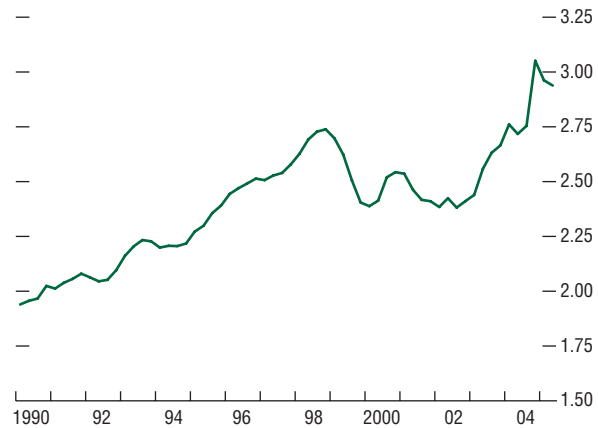
ice debt has been greatly strengthened. For example, the ratio of the earnings to interest coverage for the United States is at a 28-year high of 5.8 times compared with a long-term average of 4.1 times (Figure 1.9). However, more recently there has been a growing tendency to re-leverage balance sheets and take actions that benefit shareholders at the expense of creditors—such as higher dividend payouts,<sup>12</sup> large share buybacks, and merger and acquisition (M&A) activities (Figures 1.10, 1.11, 1.12, and 1.13 ).

In particular, leveraged buyouts (LBOs), facilitated by a significant increase in the volume of LBO loans in the United States and Europe (Figure 1.14), could significantly weaken the credit quality of the acquired company. Recently, acquirers (usually private equity funds and, increasingly, hedge funds) have adopted the practice of significantly leveraging the balance sheets of the companies they have just acquired so as to pay high dividends to themselves right away. This is in contrast with past practices according to which acquirers spent about five years (if not more) improving the profitability of the acquired company before doing an initial public offering (IPO) or a trade sale to realize their investments. As a result of a more aggressive LBO style, in terms of both leveraging and a much shorter time frame, the credit quality of the acquired companies may deteriorate sharply, typically leading to a multiple-notch downgrading by the rating agencies. For corporate bondholders, this type of idiosyncratic risk is more difficult to anticipate because it can materialize abruptly and to some extent arbitrarily, compared with a deterioration of the company’s business over time.

As the private equity funds have been able to attract large amounts of funds in the past

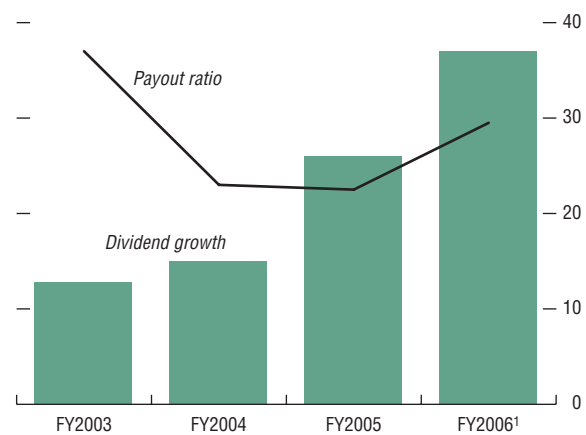
<sup>12</sup>In the United States, higher dividends may also reflect changes in U.S. tax policy, which reduced the income tax rate on dividend income.

**Figure 1.10. Net U.S. Corporate Dividend Payments**  
(In percent of GDP; 4-quarter moving average)



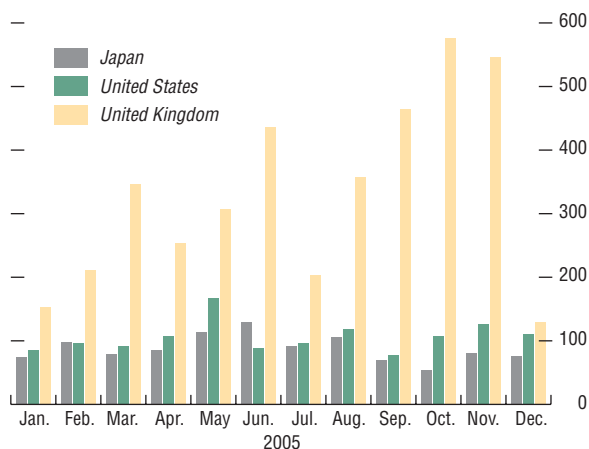
Sources: Board of Governors of the U.S. Federal Reserve System, *Flow of Funds Accounts of the United States*; and IMF staff estimates.

**Figure 1.11. Japanese Dividend Growth and Payout Ratio**  
(In percent)



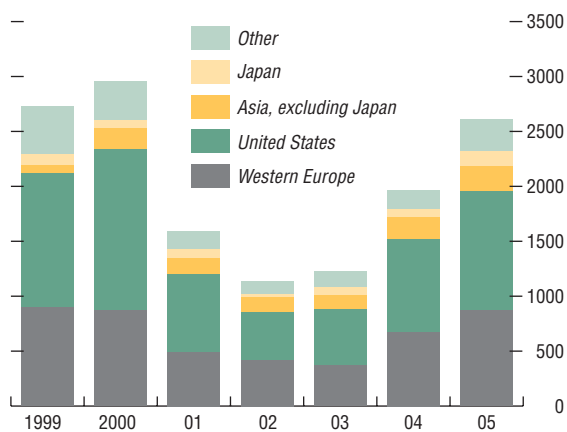
Sources: UBS; and IMF staff estimates.  
<sup>1</sup>Estimated.

**Figure 1.12. Announced Share Buybacks**



Source: Bloomberg L.P.

**Figure 1.13. Global Merger Activity**  
(In billions of U.S. dollars)



Source: Bloomberg L.P.

year or two, and as they have reportedly increased the degree of leverage (from 3–4 times earnings before interest, taxes, depreciation, and amortization (EBITDA) to 6–8 times), they have the financial resources to target a much wider range of companies. As an illustration, LBO debt raised in 2004–05 in the U.S. market amounted to \$200 billion, or 5 percent of total corporate debt outstanding. Thus, despite strong balance sheets for the corporate sector as a whole, this is one reason for the rise in idiosyncratic risk.

In more traditional areas, specific industries that are burdened by overcapacity—such as the automobile and airline industries—are expected to continue to shrink and cause specific companies to suffer deterioration along the way. More generally, companies that—for other reasons—neglected to improve their finances could be exposed to pressure as cyclical conditions become less favorable.

In short, the turning of the credit cycle brings about an increase in idiosyncratic risk, though against the backdrop of still-healthy balance sheets of the corporate sector as a whole. The most likely repercussion of this development is a widening of credit spreads for specific firms (a stronger differentiation between credit quality on the part of investors should be healthy and not lead to a general “blowout” of credit spreads).

If such a company-specific deterioration in credit quality were to affect a very large “name” in the fast-growing market for credit derivatives and structured credit, and if it were to materialize in an abrupt and unexpected fashion, there is a possibility that this could upset some of the complex correlations on which investment positions in these markets are often predicated (see Chapter II). A sudden drying up of liquidity as a result of unexpected price dislocations could, in turn, lead to large-scale redemptions for hedge funds active in this area. As a potential next step in such a chain reaction, hedge funds could feel under pressure to liquidate other assets—in other words, start a contagion process.

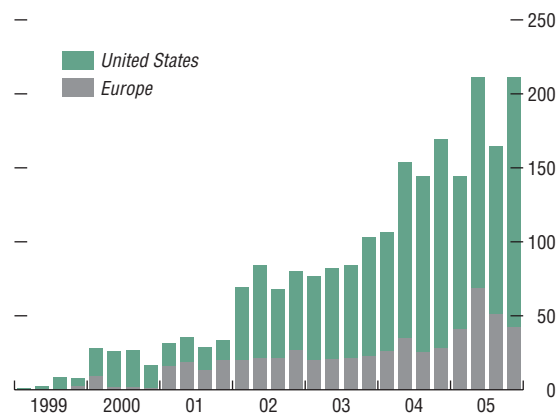
Overall, however, the healthy corporate sector balance sheet and the still-low default rates should provide firm anchors to the credit markets—the broad corporate spread should change more moderately. This would enable the self-correcting forces to operate: as some credit spreads move beyond perceived fundamental values, other investors would step in and, in the process, stabilize the markets.

### Turning of the Credit Cycle: Impact on Housing and Mortgage Markets

The housing and mortgage markets also signal a turning of the credit cycle. In the United States, indicators of housing activity have fallen in recent months in response to higher interest rates. In particular, the Mortgage Bankers Association’s purchase index, a leading indicator, has fallen by about 15 percent since July 2005. Average house price increases appear to have decelerated from an annual rate of 12.95 percent in the fourth quarter of 2005.<sup>13</sup>

There are two related concerns by market participants. First, cooling house prices could reduce the volume of home equity withdrawal and therefore help to weaken personal consumption and economic growth. According to IMF staff estimates, a slowdown of U.S. real house price appreciation from 10 percent last year to zero would reduce personal consumption by around 0.5–1 percentage point. At the same time, this could allow the personal savings rate to rise somewhat, thus contributing to a moderation of the U.S. current account deficit. For the U.S. household sector, as an illustration, a 10 percent outright decline in average house prices would reduce household net worth by \$1.9 trillion to \$49.1 trillion—or from 564.9 percent of disposable personal income to 545.5 percent, still well above the low level

**Figure 1.14. Issuance of Leveraged Loans**  
(In billions of U.S. dollars)



Source: Bloomberg L.P.  
 Note: Leveraged loans are floating-rate obligations issued to corporations that rating agencies have typically assigned noninvestment-grade ratings, and that bear a yield in excess of 125 basis points over major benchmark rates such as LIBOR and EURIBOR.

<sup>13</sup>According to the latest release by the Office of Federal Housing Enterprise Oversight (March 1, 2006).

reached in 2002.<sup>14</sup> Even though much of household wealth is in relatively illiquid forms, such as housing and pension claims, this level of net worth is still important as a cushion to help households absorb potential losses.

The second concern is that higher interest rates could raise the debt-servicing burden of homeowners—at present, the debt-service-to-income ratio for the household sector is already at a high level of 13.5 percent. This could worsen the credit quality of the mortgage markets and result in losses for the lending institutions. However, because 60 percent of U.S. mortgages are at long-term fixed rates, the increase in the debt-service burden would be limited in the near term. The credit quality of the traditional prime quality mortgage market is quite high—the delinquency rate is near record lows and should not worsen too much if the U.S. unemployment rate remains low and personal income continues to grow. Moreover, U.S. mortgage lenders have distributed large portions of their mortgages to a wide range of investors in the mortgage-backed securities market, and many of those investors, such as life insurance companies, may be in a better position to hold mortgage risks because of their longer-term liabilities and lower liquidity pressures than banks. Consequently, the impact on financial intermediaries active in the large prime quality mortgage market is likely to be rather limited.

The main vulnerability in the U.S. mortgage markets at present lies more in the sub-prime segment of the market.<sup>15</sup> Many sub-prime borrowers in these new instruments intend to

refinance fairly quickly to take advantage of any house price appreciation and to avoid refixing at higher rates. However, rising interest rates, a cooling-off in the U.S. housing market, and regulatory tightening, all of which would make it more difficult for these borrowers to refinance if they cannot otherwise qualify for a traditional mortgage, mean that many will be trapped in the original reset terms of these mortgages. An estimated \$140 billion of such mortgages are due to be refixed in 2006, and \$350 billion in 2007.<sup>16</sup> The result is that the delinquency rate in this market segment will probably rise. Anticipating this, spreads on asset-backed securities (ABS) using sub-prime mortgages and on collateralized debt obligations (CDOs) including or referencing such ABS have widened substantially (Figure 1.15). Since these markets are new, there are concerns about whether investors, especially new entrants, fully understand the risk and have the capacity to adequately manage it.

While these developments in the U.S. housing market bring risks that bear watching, especially the risk of a larger-than-expected fall in personal consumption, there are prospects of a “soft landing,” judging from the experience in the United Kingdom and Australia. House prices in these countries—which increased by much more than in the United States—decelerated sharply from around 20 percent annual growth in 2003–04 to practically zero for most of 2005. Since then, U.K. house prices have recovered, rising by 1.4 percent in January 2006.<sup>17</sup> The main impact of the price adjustments seems to have

<sup>14</sup>Calculations based on Federal Reserve Board’s U.S. Flow of Funds, December 2005.

<sup>15</sup>Sub-prime mortgages refer to mortgages granted to borrowers who otherwise could not qualify for a traditional mortgage. This has been accomplished by lenders relaxing credit standards and/or documentation requirements for such borrowers and via new mortgage products designed to minimize the debt-servicing burden during an initial period. These products offer features such as no down payments, variable rates to take advantage of lower short-term rates, and interest only and/or no amortization products. This market segment has grown rapidly in the past 18 months, accounting for about 30 percent of new mortgage origination in 2005, even though it still represents a small portion of the outstanding mortgage market in the United States.

<sup>16</sup>Lehman Brothers MBS and ABS Research (2006).

<sup>17</sup>According to a 2006 press release of the Nationwide Building Society.

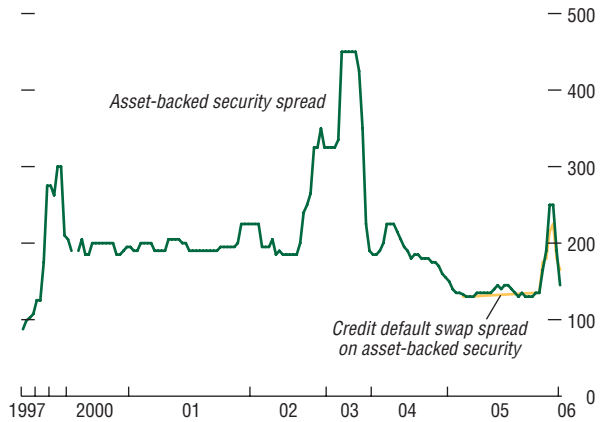
been a weakening of personal consumption, which contributed to the slowdown of these economies. The impact on financial institutions and markets has been mild—a small uptick in delinquency rates and increased bad loan provisions, which were absorbed by lending institutions without signs of stress.

**Turning of the Credit Cycle: Impact on Emerging Bond Markets**

In contrast to the spread widening in corporate and mortgage markets in mature economies, spreads on EM international bonds have continued to trend to record low levels (Figure 1.16). As examined in previous issues of the GFSR, improvements in the fundamentals of the EM countries and favorable external financial conditions have attracted growing capital inflows, contributing to the EM spread compression (see Chapter III). Improvement in the EM countries as a whole, of course, masks some individual countries’ weaknesses—but by and large EM countries are stronger. Of particular importance is the fact that EM countries have run large current account surpluses for six consecutive years. Growing private sector capital inflows—particularly foreign direct investment (FDI) flows (see Box 1.4, p. 26)—combined with the current account surplus, meant that the EM countries had to accumulate a huge volume of international assets, through both the public and the private sectors (Table 1.3).

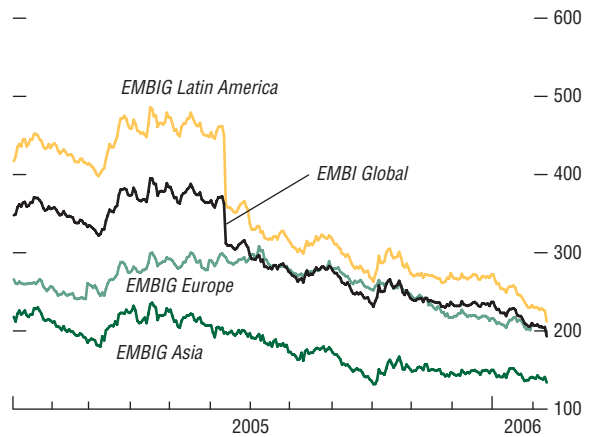
Focusing on determinants of the declining EM spreads, an econometric analysis of EM bond spreads (Box 1.5, p. 28) shows that fundamental factors (including economic, political, and financial developments) and external financial variables (mainly volatility measures and the Fed funds futures rate) have contributed about equally to explaining EM spread movements. The fundamental factors have explained rather well the downward trend in EM spreads since 2001. The external financial variables have explained the volatility in the EM spreads. Consequently, if the funda-

**Figure 1.15. U.S. Asset-Backed Spreads<sup>1</sup>**  
(In basis points)



Source: Bear Stearns.  
<sup>1</sup>For the Baa tranche of asset-backed securities composed of floating-rate home equity lines of credit.

**Figure 1.16. Emerging Market Spreads**  
(In basis points)



Sources: JPMorgan Chase & Co.; and Merrill Lynch.

**Table 1.3. Emerging Markets and Developing Countries: Current Account Balance and External Financing**  
(In billions of U.S. dollars)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005 <sup>1</sup>	2006 <sup>1</sup>
Current account balance	-85	-85	-115	-18	88	43	86	114	228	410	494
External financing	339	424	296	250	243	178	203	269	454	395	393
Of which:											
Foreign direct investment	129	167	173	176	168	181	167	158	210	221	223
Private debt	123	143	44	14	42	-45	-6	68	178	114	93
Asset accumulation	254	339	182	233	331	220	288	414	681	805	887
By official sector (reserves)	81	54	-54	4	111	84	124	367	514	600	612
By private sector	173	285	236	229	220	136	164	47	167	205	275

Source: International Monetary Fund, *World Economic Outlook*.

<sup>1</sup>Data for 2005 are estimated and data for 2006 are forecast.

mental improvements in EM countries remain intact, a worsening of the external financial variables—for example, a rise in volatilities and/or in the Fed funds futures rate—would be consistent with a widening of the EM spreads, but probably around the trend line instead of a reversal to the long-term mean. In other words, improved fundamentals in EM countries will most likely act to offset EM bond spread movements because of a worsening of cyclical conditions.

This assessment goes hand in hand with the maturing of EM bonds to eventually become a mainstream asset class for international investors. Specifically, the yield premiums that EM bonds have to offer over comparably rated mature market (MM) corporate bonds have declined steadily since 2001 (Figure 1.17). In addition, EM bond spreads have continued to narrow even after the Federal Reserve began to tighten monetary policy in mid-2004, instead of widening as in the past. Thus, it appears that EM bonds are increasingly being evaluated using normal capital market yardsticks, with concerns decreasing about their special emerging market characteristics. As such, EM bond markets as a whole will behave like any other securities markets in MM countries, that is, bonds will be priced according to their creditworthiness. They would be subject to market corrections because of changes in cyclical conditions, but probably become less prone to the kind of stress and crisis experienced in the past (or

“feast and famine,” as we called it in previous issues of the GFSR).

In particular, EM bond markets are likely to be less vulnerable to near-term fluctuations in external financial market conditions, since EM countries have prefinanced more than half of their 2006 external issuing plans because of their active debt management operations. Latin American countries have practically completed their 2006 financing plans, and a few countries have begun to prefinance their 2007 requirements (see the appendix on Emerging Market Financial Flows). Some have begun to buy back their external debt, causing EM spreads to tighten further as international investors begin to deal with the prospect of a declining supply of external sovereign debt in the face of their strong demand.

While the EM countries as a group have become net exporters of capital and hence tended to reduce their external financial vulnerability, a number of countries, including those in Central and Eastern Europe, are experiencing developments traditionally associated with increased external vulnerability—large current account deficits, rapid credit growth, and rising external debt. In interpreting trends in the Central and Eastern European region, the offsetting and mitigating factors (including membership in the EU and, in time, in the euro area), as well as the considerable differentiation across countries, must be borne in mind. In some countries, fis-

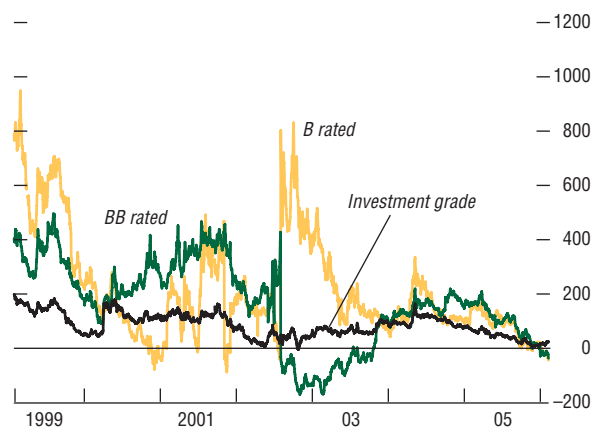


cal positions are broadly balanced and public indebtedness relatively low. In these countries, as well as others, sizable current account deficits—and, hence, reliance on foreign savings—are associated with rapid growth, consistent with their catch-up potential as new members of the European Union. Moreover, in some countries, falling reserve coverage of short-term debt obligations reflects, in part, borrowings by domestic subsidiaries from reputable and well-supervised parent banks. Nevertheless, risks are inherent in such situations. In particular, where current account deficits reflect the inability to rein in fiscal deficits, and public debt ratios are on the rise, strong policy efforts to contain these trends are needed lest these countries face increased market scrutiny when the environment turns less friendly.

**Global Imbalances and Capital Flows**

There is broad agreement among policymakers and market participants that a “disorderly” unwinding of global imbalances could, and probably would, have very negative consequences for financial stability. If the necessary financing of the U.S. current account deficit were to require significant risk premiums to be factored into prices for U.S. assets, the global economy and world financial markets would be seriously affected. Given the increasingly global asset allocation process, spillover effects in virtually all other asset markets should be expected. Also, once such a development were to gain momentum, it is not clear how soon countervailing forces would kick in. Given the dominance of U.S. financial markets in the global economy, it is not automatic that other non-U.S. dollar based asset classes would automatically benefit. It is quite possible in such a scenario that a “decoupling” of non-U.S. dollar assets would be confined to government bond markets at best. A combination of a weaker dollar, higher market interest rates, depressed equity markets, and widened credit spreads could create a

**Figure 1.17. Spread Differences Between Emerging Market and U.S. Corporates**  
(In basis points)



Sources: JPMorgan Chase & Co.; and Merrill Lynch.

### Box 1.4. Foreign Direct Investment in Emerging Market Countries

This box discusses recent trends in foreign direct investment in emerging market countries and reports on discussions with a private sector contact network.

Total FDI flows to EMs increased substantially in 2004 and 2005 (see the figure). The inflows in 2004 amounted to \$180 billion, 41 percent higher than in 2003 and above the 2001 peak, although they were smaller as a share of GDP (2.7 percent rather than 3.1 percent).<sup>1</sup> Foreign direct investment in EMs is estimated to have increased by more than 10 percent in 2005. The increases in FDI have been fueled by improved growth, higher commodity prices, improved business and investment climate, perceptions of reduced risks in EMs, and more M&A activity in EMs. Equity financing represented the bulk of FDI flows to EMs: 87 percent in 2002–04.<sup>2</sup>

Almost all regions experienced expansions in FDI in 2004. The largest increases were in emerging Europe, Central Asia, and Latin America. Flows to Asia also increased. In 2005, flows to emerging Europe, Central Asia, and Asia continued to increase strongly, but declined somewhat to Latin America. Flows to South Africa increased dramatically because of a large bank acquisition.

Increasingly, EM firms are globalizing: outward FDI from EMs has increased rapidly over the past several years. Some EMs that have been large recipients of FDI have become

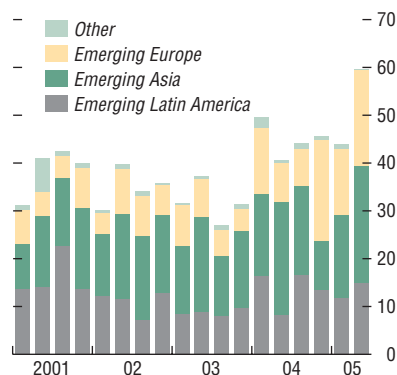
Note: The main author of this box is Paul Ross. The box draws heavily from the work of the IMF–World Bank FDI group. The members of the group are Charles Blitzer, Ceyla Pazarbasioglu, and Paul Ross (all IMF), and Thomas Davenport, Joseph Battat, Dilek Aykut, and Zenaïda Hernandez (all World Bank Group).

<sup>1</sup>As in the previous issues of the GFSR, the data on and discussion of FDI inflows to EMs focus on the 22 largest EM recipients, which account for about 85 percent of FDI inflows to all developing countries. The data for 2004 have been revised upward substantially, because of revisions of reinvested earnings in several countries.

<sup>2</sup>Based on the IMF's *World Economic Outlook* data.

#### Foreign Direct Investment in Emerging Markets

(In billions of U.S. dollars)



Sources: National authorities; and IMF, *International Financial Statistics*.

sources of outward FDI. The World Bank's forthcoming *Global Development Finance* report will include a fuller discussion of FDI flows between EMs.

The IMF and the World Bank Group staff have established an informal private sector contact network to discuss FDI in EMs to (1) improve surveillance and forward-looking assessments of FDI flows to EMs and (2) seek input for IMF–World Bank policy advice on FDI and the business climate.<sup>3</sup> Discussions with a network of participants from EM and MM countries focused on the following:

<sup>3</sup>See September 2005 GFSR, Box 2.5: "Foreign Direct Investment to Emerging Market Countries: An Asian Perspective." The group comprises senior executives from 40 private sector companies and financial institutions. The companies operate in the following sectors: natural resources and mining, food and beverage, metals, machinery and motor vehicles, financial services, electronic goods, consumer goods, telecommunications, information technology, utilities, and retail. About half of the contact network participants are EM firms.

- The increase in FDI to EMs in 2004–05 appears more to be a part of a secular trend rather than being driven by cyclical factors. With relatively high growth prospects, EM countries as a group are seen as justifying an increased share of the investment pie. Furthermore, perceptions of the riskiness of EM investments are declining because of improved macroeconomic and structural policies, and growing transparency and other steps taken to improving the business climate in many countries. In addition to increases in FDI in EM countries, FDI flows from firms located in these countries—directed to new businesses in both other EMs and MMs—have been increasing rapidly, and that trend is widely expected to continue.
- The dominant strategic reason for most FDI investments is diversification into new markets. Diversification strategies are being followed similarly by firms headquartered in emerging markets as well as by traditional FDI investors from mature market countries. With the focus being on potential market size and growth, interest in China remains extremely high. However, investors also anticipate increasing their businesses (or establishing new ones) in other large EM countries. Efficiency-seeking FDI appears most concentrated in emerging Europe, some Southeast Asian countries, India (services more than manufacturing), and China. EM investors differ in some ways from MM investors: they have a more regional outlook and some are concentrating in niche markets for reasons of scale familiarity.
- Controlling and managing FDI-related risks are an integral part of companies' strategies. They actively manage their foreign currency exposure arising from balance sheets and revenues of overseas businesses. Managing these risks incurs management and financial costs; the cost of managing these risks can sometimes be a significant factor in locating FDI projects. Investors continue to generally prefer wholly owned subsidiaries but often team up, at least temporarily, with local partners, when they lack local knowledge, networks, or contacts; where there are limitations on foreign ownership; or to espouse a more “local” image. Most investors seek management control.
- Financing of FDI investments is shifting to local sources. Equity investments most typically continue to be financed by the parent company. However, debt financing increasingly is in local currency and sourced locally, and reliance on parent company guarantees is diminishing. Many investors anticipate that over time they will rely less on bank loans and more on bonds as local capital markets develop further. This development is important in that FDI and local capital market development are supportive of each other. Foreign direct investors' desire to increase their use of local capital markets is a positive supply-side factor for development of these markets that allows local institutional investors to diversify their portfolios. Thus, it is likely that the development of local capital markets will increase interest from foreign direct investors.
- Investors look to the IMF and the World Bank Group to continue to promote policy improvements that would further facilitate FDI in EMs. In addition to the activities that both institutions now undertake, investors (those that undertake foreign direct investment) asked that the IMF and the World Bank Group focus more on strengthening the legal and regulatory framework for the private sector, developing local capital markets and private equity initiatives, disseminating more information on less well known (smaller) member countries, encouraging public-private sector dialogue, and playing a greater role in investment dispute resolution.<sup>4</sup>

<sup>4</sup>Some participants wanted involvement from the IMF and the World Bank Group that goes beyond the scope of the work of the International Center for Settlement of Investment Disputes, which is part of the World Bank Group.

### Box 1.5. Main Drivers of Emerging Market Bond Spreads: Fundamentals or External Factors?

Over the past several months, spreads on emerging market debt have reached record low levels. This box sheds light on a number of questions concerning developments in emerging markets. Are emerging market spreads appropriately priced in relation to own-country fundamentals and external conditions? What have been the improvements in fundamentals? How have external factors influenced spreads? Why have spreads narrowed even though the Fed has tightened rates? How resilient would emerging market spreads be in the face of a deterioration in the external environment?

#### *The Model*

We explore the determinants of emerging market sovereign debt spreads using a simplified version of the panel data model presented in the September 2004 GFSR.<sup>1</sup> The model sheds light on spreads for individual countries and can be aggregated to predict the composite JPMorgan EMBIG index. The data consist of monthly observations between January 1998 and December 2005, in a panel for the countries in the EMBIG index.<sup>2</sup> Spread determinants include country factors as well as external factors.

The dependent variable is the log of EMBIG spreads at time  $t$ . Lagged variables are not included in the model, which is estimated using fixed effects. As proxies for country fundamentals, we use a set of economic, financial, and political risk ratings, whereby higher ratings indicate better fundamentals and lower risk.<sup>3</sup> The

ratings are updated on a monthly basis and are constructed in a transparent manner with less judgment compared with credit ratings, which are commonly used to proxy fundamentals. To capture the effects of external factors, we include an index of the implied volatility of the U.S. stock market, VIX, which we take as a proxy for investors' perception of global financial risk. We further include the yield on three-month Fed funds futures to gauge the effects of U.S. monetary policy and international liquidity on emerging market spreads. The volatility of the Fed funds futures market is included to capture the extent to which uncertainty about future U.S. monetary policy affects emerging market spreads.<sup>4</sup>

In recent years, the economic and financial risk ratings of the EMBIG countries have seen strong improvements, reflecting the substantial accumulation of international reserves in major emerging markets, persistent current account surpluses, improved fiscal balances, contained inflation, and lower foreign debt to GDP (see first figure). The improvement in the political risk rating for the EMBIG countries has been less dramatic in recent years. In 2005, closely contested elections in several countries in emerging Europe and the upcoming election cycle in Latin America weighed on government stability and the political risk rating for the EMBIG countries as a whole.

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and the current account to GDP. The financial rating includes variables such as foreign debt to GDP, net international liquidity as months of import cover, and a measure of exchange rate stability. The political variable includes various more subjective measures of political risk, such as government stability, conflict, and bureaucracy quality. Each country is assessed on the same basis to allow for comparability. A higher rating indicates better fundamentals and lower risk. The political variable takes a value between 0 and 100, whereas the economic and financial variables range between 0 and 50.

<sup>4</sup>The volatility of the Fed funds futures market is calculated as the standard deviation of the difference between the yield on three-month-ahead Fed funds futures and the Fed funds target rate. For a detailed explanation of the independent variables, see Kashiwase and Kodres (forthcoming).

Note: The main author of this box is Kristian Hartelius.

<sup>1</sup>For a lengthier and more recent exposition of the research underlying this box, see Kashiwase and Kodres (forthcoming).

<sup>2</sup>We exclude Argentina because of breaks in the series related to debt restructuring. Due to short data series, we also exclude Serbia and Montenegro, Indonesia, Vietnam, Greece, and Qatar from the model. The analysis thus includes 32 countries.

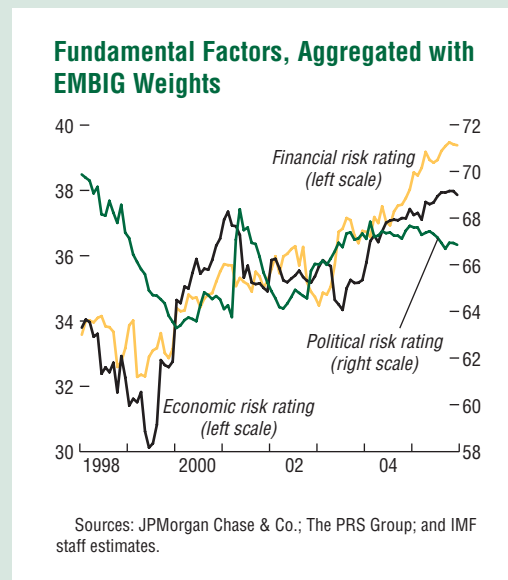
<sup>3</sup>The *International Country Risk Guide*, published by the PRS Group, releases monthly ratings covering three types of risks: economic, financial, and political. The economic risk rating includes variables such as annual inflation, budget balance to GDP,

Our proxy for investors' perception of global financial risk has seen a dramatic decline over the past few years. From the beginning of 2003 to the end of 2005, the VIX declined by more than 50 percent to its lowest level since 1995 (see second figure). During the same period, in contrast, the Fed funds futures rate increased by 333 basis points as a result of the monetary policy tightening by the Federal Reserve. The cross-correlations between the explanatory variables are all low, except for the economic and financial risk ratings, which tend to move together (their correlation is 0.68).

**Results**

The signs of the estimated coefficients confirm the findings in the September 2004 issue of the GFSR. Improved fundamentals are associated with lower spreads, whereas higher expected volatility of U.S. equities, higher volatility on the Fed funds futures market, and tighter U.S. monetary policy are all associated with higher spreads (see the table below).<sup>5</sup>

<sup>5</sup>The estimates are robust to changing the model specification, the estimation techniques, as well as the sample. The coefficients remain significant, and keep their signs and magnitudes, over a longer sample starting in 1993, during which the variables show much less pronounced trends.



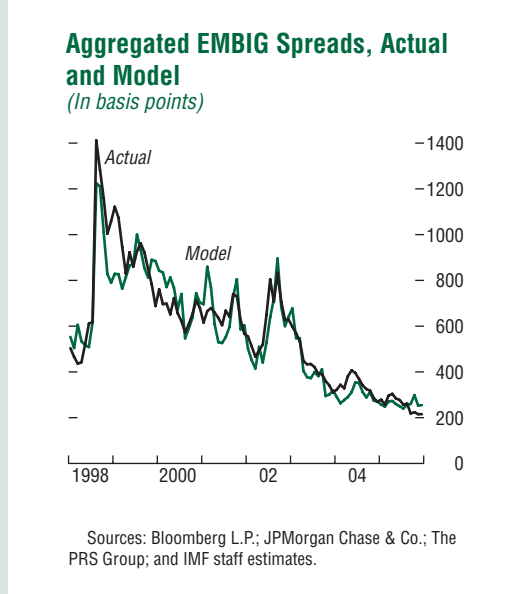
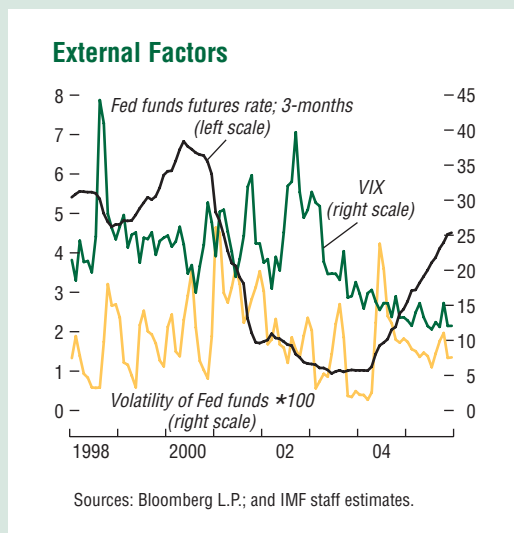
In the aggregate, the model appears to follow the general movement of actual spreads. In the third figure, the actual and the EMBIG spreads predicted by the model for each country have been aggregated using the weights in the EMBIG index. The close fit of the model, an overall *R*-squared of 0.57, implies that the recent levels of EMBIG spreads are in line with what we would expect, given historical relations between

**Emerging Market Bond Spreads: Fixed-Effect Panel Regression Model**

	Coefficient	Standard Error	t-statistic	Percent Impact on the Spread by One Standard Deviation Increase
Dependent variable: Log of EMBIG spreads				
Explanatory variables				
Economic risk rating	-0.035328	0.003162	-11.17	-9.39
Political risk rating	-0.027701	0.001879	-14.74	-8.55
Financial risk rating	-0.038093	0.003209	-11.87	-10.65
VIX	0.038216	0.001171	32.63	29.17
Three-month-ahead Fed funds futures rate	0.044670	0.004065	10.99	9.87
Volatility of three-month-ahead Fed funds futures rate minus target rate	1.476950	0.138052	10.7	8.56
<i>R</i> <sup>2</sup> within	0.57			
<i>R</i> <sup>2</sup> between	0.58			
<i>R</i> <sup>2</sup> overall	0.565			
Number of observations	2,634			

Sources: Bloomberg L.P.; The PRS Group; JPMorgan Chase & Co.; and IMF staff estimates.

**Box 1.5 (concluded)**



the variables. However, by the end of 2005, spreads were about 40 basis points lower than predicted by the model, and spreads have since narrowed further into 2006.

To assess the sensitivity of spreads to changes in fundamentals, we calculate the percent change in the model spread that would result from a one standard deviation increase in each variable, other things being equal (see the table).<sup>6</sup> A one standard deviation improvement in any of the three risk ratings leads to a drop in the country spread by about 10 percent of the prevailing level. However, since the economic and financial risk ratings tend to move together, this measure is likely to understate the sensitivity of the model spread to changes in fundamentals.

By decomposing the model dynamics, we can get an insight into how important the recent improvements in fundamentals have been for the tightening of EMBIG spreads.<sup>7</sup> Since the beginning of 2003, the aggregated model spread has fallen by 422 basis points. Improved finan-

cial and economic risk ratings contributed 105 basis points and 53 basis points of this drop respectively, while improvements in the political risk rating contributed to a decline in the aggregate spread by 19 basis points. The impact of improved fundamentals has thus been less than 50 percent of the total decline in spreads since January 2003. However, a separate regression using only the three risk ratings as independent variables reveals that fundamentals can explain much of the trend in EMBIG spreads over the full sample (see fourth figure). The overall *R*-squared for the regression using only fundamental factors is 0.5. The estimated coefficients are of the same sign and order of magnitude as in the full model.

Turning to the external factors, the model singles out investors' perception of global financial risk as the variable that has the largest impact on spreads. An increase in VIX by one standard deviation causes spreads to increase by 29 percent of the prevailing level, other things being equal. The corresponding effects of changes in the Fed funds futures rate and the volatility in the Fed funds futures market are both close to 10 percent of the prevailing level of spreads.

<sup>6</sup>For reasons of comparability, we use the standard deviations of the risk ratings for each country.

<sup>7</sup>We calculate the effects of the different variables on each predicted country spread and aggregate the effects using EMBIG weights.

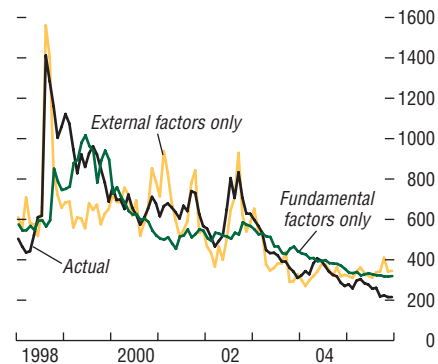
When decomposing the dynamics of the model, we also find that lower global risk has been a major reason behind the recent tightening of EMBIG spreads, with the VIX contributing as much as 280 basis points to the decline since the beginning of January 2003. Higher Fed funds futures rates have had an upward effect on spreads in the model (57 basis points since January 2003), but the downward effects of stronger fundamentals and lower perceived global risk have dominated the effects of tighter monetary policy. Our measure of uncertainty about monetary policy has declined somewhat since January 2003, which in the model contributes to the drop in the aggregate EMBIG spread by 22 basis points. A separate regression using only the three external factors as independent variables suggests that much of the fluctuation in EMBIG spreads can be explained by the external variables (see fourth figure). The “*R*-squared within” for the regression using only external factors is 0.41, and the estimated coefficients are of the same sign and order of magnitude as in the full model.

### Conclusions

EMBIG spreads may currently be too finely priced, as suggested by the fact that spreads toward the end of our sample were lower than what the model predicted. However, the difference between predicted and actual spreads was only 40 basis points by December 2005.

The analysis suggests that improved own-country fundamentals can explain much of the trend in EMBIG spreads, whereas external factors capture a lot of the volatility in emerging market bond spreads. The two sets of explanatory variables complement each other and seem to be of about equal importance for explaining EMBIG spreads since 1998. The model shows

**Aggregated EMBIG Spreads, Actual and Predicted by Separate Regressions**  
(In basis points)



Sources: Bloomberg L.P.; JPMorgan Chase & Co.; The PRS Group; and IMF staff estimates.

that improved fundamentals cannot fully explain the record tight EMBIG spreads. The low volatility environment of global financial markets is a crucial element in explaining the dramatic tightening of EMBIG spreads since January 2003.

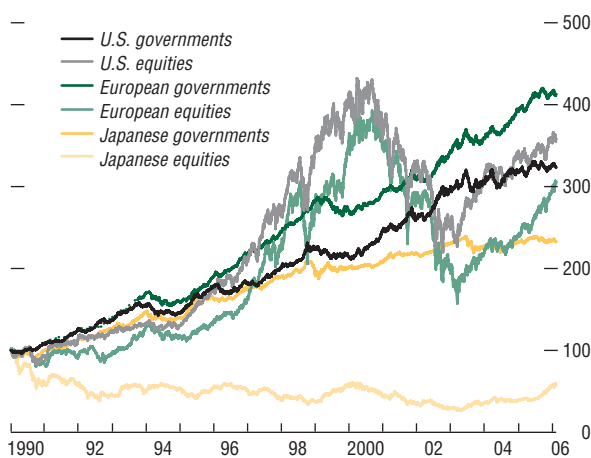
How resilient would emerging markets be in case of a deterioration in the external environment? With the end of the Fed’s tightening cycle drawing near, the main threat in the external environment is an increase in global financial market volatility. Assuming the linear model continues to be valid, an increase in VIX by two standard deviations (13.2 points in the sample) would result in an increase in the aggregated spreads by 140 basis points, other things being equal. Given that such an external shock would bring spreads merely to their level of summer 2004, it appears that EMBIG spreads are well anchored in fundamentals.

vicious circle resulting in a sharp drop in risk appetite. It would go without saying that all “warehouses” of financial risk—banks and nonbanks alike—would see negative repercussions as to their earnings capacity and their

capital base. Hence, the question is, how likely is it that such a scenario will unfold anytime soon?

Most recently, global imbalances have continued to widen, with the U.S. current account

**Figure 1.18. Asset Class Performance, 1990–2006**  
(In local currency)



Sources: Bloomberg L.P.; and Merrill Lynch.

deficit reaching about 6.5 percent of GDP. Conversely, current account surpluses have increased, in particular in EM countries—in Asia and even more so among oil-exporting countries. In fact, the current account surplus of the EM countries is estimated to be around \$500 billion in 2005 and 2006. So far, increasingly globalized and flexible financial markets have smoothly intermediated capital flows from surplus to deficit countries, mainly the United States. At present, there seems to be a willingness in the rest of the world to accumulate U.S. assets—without any visible risk premium attached (see Box 1.6). Motivations range from central banks acquiring foreign exchange reserves, in part to avoid the appreciation of their local currencies, to private sector investors buying U.S. assets for a variety of reasons (including retirement needs). In fact, the share of U.S. assets in total wealth of the world has increased from about 5 percent 20 years ago to around 17 percent in recent years—accounting for 40 percent of global annual income.<sup>18</sup>

There are several reasons why the United States is so attractive to international capital flows. Some reasons are more structural, others might well change with cyclical developments.

- In an unprecedented way and not matched—at least not in full—by any other region, the United States has created large, deep, flexible, sophisticated, and by and large well-regulated financial markets that offer a wide range of assets to meet different needs. In addition, the U.S. dollar is the world’s major reserve currency. As such, U.S. financial markets have become the destination of choice for excess savings. Such savings increasingly originate from EM countries, whose financial markets have not developed enough to supply the volume and range of assets required to meet the

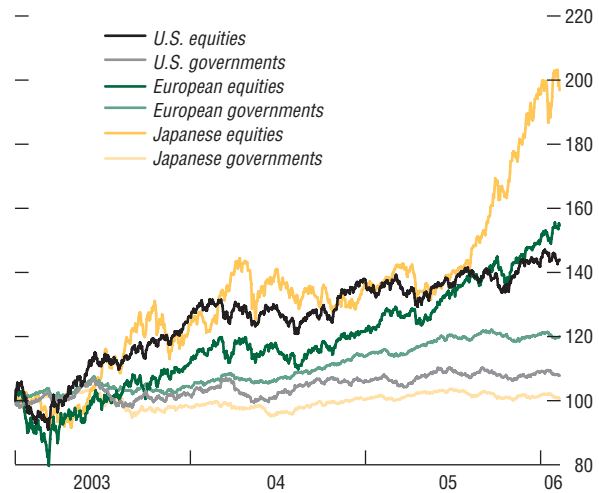
<sup>18</sup>Caballero, Farhi, and Gourinchas (2006). This development also reflects the overall decline in home bias observed in many countries.



needs of the investors.<sup>19</sup> While financial markets in EM countries are being developed, it will take a long time for them to catch up as the U.S. markets are also evolving. Thus, the advantage enjoyed by the U.S. financial markets is an important structural feature in the allocation of global savings, and it explains why other high-growth countries in the OECD area, such as Canada and Finland, have not attracted more capital flows.

- In parallel, and for a number of years now, the United States has enjoyed a higher trend growth rate than the euro area and Japan, which also have relatively well-developed financial markets. This growth differential helps to explain why the euro area and Japan do not attract similar volumes of capital inflows, especially on a net basis. Over time, a higher trend growth rate should produce better returns on financial assets—thus rewarding international investments in U.S. assets. Indeed, since 1990, U.S. equity and fixed-income markets have performed well compared with similar markets in Europe and Japan (Figure 1.18). However, since 2003, the U.S. assets have noticeably underperformed their European and Japanese counterparts in both equities and bonds (Figure 1.19). Furthermore, the substantial growth and interest rate differentials in favor of the United States compared with Europe and Japan are expected to narrow somewhat over the year ahead. It is not clear whether international investors' expectations of future returns on U.S. assets

**Figure 1.19. Asset Class Performance, 2003–06**  
(In local currency)



Sources: Bloomberg L.P.; and Merrill Lynch.

<sup>19</sup>Caballero, Farhi, and Gourinchas (2006) construct a model according to which the United States has good quality financial assets and strong growth potential, Europe and Japan have good assets but slow growth, while the emerging market countries have strong growth and demand financial assets but are unable to produce them domestically. In such a model, an equilibrium could be established where the United States has persistent current account deficits and capital inflows (largely from the EM countries), and the dollar tends to be stronger and interest rates lower than implied by traditional economic models.

**Box 1.6. Petrodollar Recycling and Capital Flows into the United States**

Oil exporter earnings this year have added substantially to other official accumulation of mature market assets. Part of the additional oil export proceeds appears to have gone, at least initially, into offshore bank deposits, predominantly in U.S. dollars. Another part of the proceeds may have gone into U.S. treasury and agency securities bought from U.K. dealers. On balance, some global financial prices may have been influenced by the flows, but the diversity of investments apparently undertaken argues for little risk to systemic stability.

Oil exporter earnings have added substantially to the pool of global savings managed by official agencies. Depending on the method of estimation, officially managed assets of the large oil-exporting nations may have risen by \$300–\$450 billion last year, at a rate comparable to the annual accumulation by Japanese authorities through early 2004, and to the accumulation by the Chinese authorities through mid-2005. Official asset buying, which has stopped for Japan but is ongoing for China, may have led to an aggregate accumulation of \$600 billion in officially managed assets in the global financial system during 2005.

Oil exporter assets in mature markets are not fully reported, creating an understatement of official transactions. Chinese official asset buying is more fully reported than that of the oil exporters, but together these official flows may be significantly understated in the U.S. balance of payments, which includes a \$195 billion estimate for official reserves accumulated in the United States during 2005, down from \$395 billion in 2004 (see the table). Some of the error may be included in the reported sharp rise in private sector investment in U.S. bonds.<sup>1</sup>

Note: The main author of this box is Lars Pedersen.

<sup>1</sup>The balance of payments presentation includes adjustment to monthly securities reports for flows through offshore financial centers and accelerated prepayment of asset-backed principal, among other adjustments.

**U.S. Balance of Payments***(In billions of U.S. dollars)*

	2003	2004	2005
Current account balance	-520	-668	-790
Private financing	241	273	595
Net direct investment	-73	-145	89
Net corporate equity	-79	-23	-49
Net bonds	329	350	486
U.S. corporate	224	243	317
U.S. treasury and agency	104	107	169
Foreign bonds	-42	-19	-22
Net bank flows and residual	65	91	69
Official financing	278	395	195
U.S. treasury and agency	225	311	151
Other	53	84	44

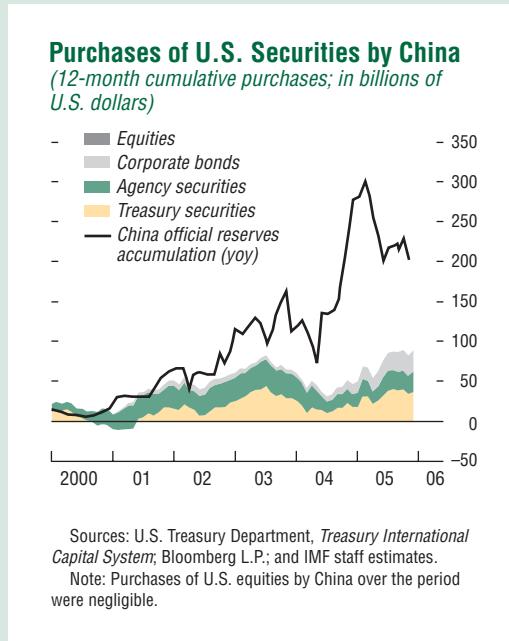
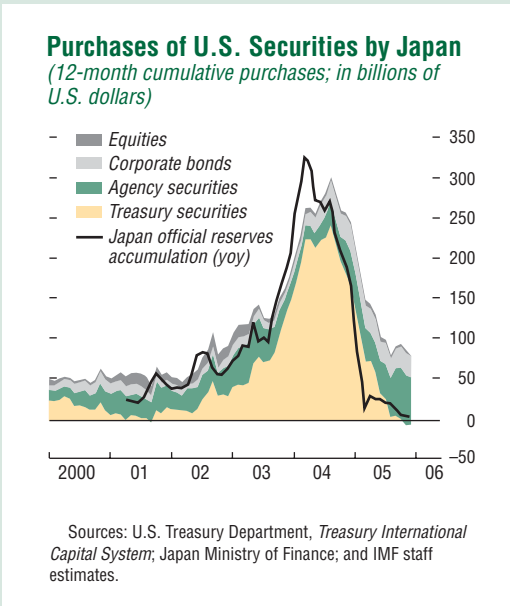
Sources: U.S. Bureau of Economic Analysis; and IMF staff estimates.

Note: Data for 2005 are through Q3, annualized.

Reported U.S. securities flows have been capturing a diminishing share of official investments. Total Japanese investment, including private and official flows, overstated official investments in U.S. markets, but not by much if an adjustment is made for normal private flows (see first figure). Chinese purchases of U.S. securities, in contrast, have been significantly less than reported reserve accumulation (see second figure). For the oil exporters, estimates of additional earnings, due to higher oil prices, are barely reflected in reported purchases in U.S. securities markets (see third figure).<sup>2</sup>

Where have the oil earnings gone? Using all available information, the best answer may be that the additional oil earnings may have gone into offshore bank deposits, U.S. treasury and agency securities bought directly and through

<sup>2</sup>Oil producer asset accumulation is approximated as the difference between spot oil prices and a two-year average that may be used for budgeting purposes, yielding an implied official accumulation rate of \$200–\$300 billion during 2005. Independently, staff estimates, based on *World Economic Outlook* estimates (built-up from expert desk analysis and available official information), put the change in oil exporter asset accumulation at \$300 billion between 2003 and 2005.

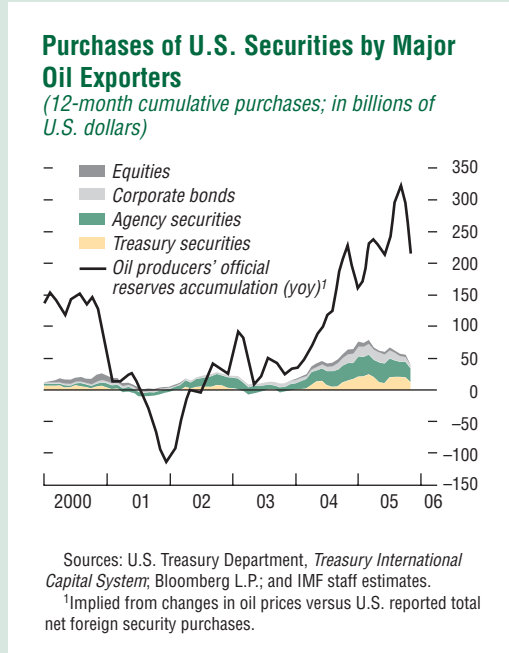


U.K. dealers, and a variety of other investments and debt repayments.

*Short-term flows.* Oil producers have deposited substantial sums at Bank for International Settlements (BIS) reporting banks, mostly in dollars. Deposits of residents in oil-producing nations at BIS banks rose by \$140 billion in the year to September 2005. Over the same period, deposits of all monetary authorities in BIS reporting banks (including those of the oil countries) denominated in dollars rose by \$110 billion. The largest offshore component of these dollar flows (\$80 billion) is not part of the U.S. balance of payments, although near-perfect arbitrage between offshore and onshore funding markets means these deposits effectively support the value of the dollar exactly as would an onshore deposit.<sup>3</sup>

*Long-term flows into U.S. securities through the United Kingdom.* Reported oil exporter buying of U.S. securities goes disproportionately into U.S. treasury and agency bonds, with compara-

tively little going to corporate bonds and equities. Recorded flows diminished, however, to a mere \$40 billion pace in the year through



<sup>3</sup>See, for example, McCauley (2005).

**Box 1.6 (concluded)**

November 2005. However, rising U.S. securities flows booked through the United Kingdom include a suggestive jump in treasury and agency bond sales to \$180 billion in the year through November, from \$120 billion a year earlier. The surge in U.S. transactions with U.K. residents in those securities favored by oil exporters suggests a significant portion of oil exporter portfolio flows has gone into U.S. markets through U.K. dealers.

*Direct investment flows.* Based on staff estimates (using *World Economic Outlook* data), a slim increase of oil exporter direct investment abroad of \$20 billion in 2005 suggests limited increases in direct investment, although several countries have reportedly used part of their export earnings to take private equity stakes in foreign companies, both in the United States and elsewhere. Widespread anecdotal evidence suggests a part of the recent growth in the venture capital and private equity funds is supported by inflows from the Middle East.

*Debt reduction.* Some oil exporters have taken the opportunity to pay off debts, following Russia's repayment of Paris Club debt totaling \$15 billion.

*Local market investments.* Finally, some of the oil surpluses appear to have also gone into real estate and equity markets in the Middle East, and into the world gold market. Many stock markets in the Middle East have seen heavy inflows this year, which have contributed to pushing the key indices to lofty levels. Local real

estate markets are also showing spectacular levels of price appreciation.<sup>4</sup>

**Impact of Oil Recycling**

Investments of oil funds, where identified, have been concentrated in dollar assets. In particular, offshore dollar bank deposits have increased substantially, providing support for the dollar. Risk-free interest rates may also have been kept lower than otherwise because of the relatively conservative investment profile of some of the oil funds. (See *World Economic Outlook*, April 2006, Box 2.3, for an estimate of the impact of oil earnings on U.S. government bond yields.) Identified investment flows do not, however, account for all of the oil earnings.

Looking ahead, the wide range of investments open to oil exporters may be a source of systemic stability. The diffuse and varied paths by which the oil funds find their way into mature markets argues that no single investor is in a position to take sudden disruptive action, although a slow diversification from dollar bank deposits into other asset classes, including those denominated in other currencies, may be expected.

<sup>4</sup>These investment options, of course, do not directly recycle windfall oil earnings back into mature financial markets. That can only happen after an official investor buys regional assets, and the sellers then deposit the payment into mature financial markets or use the funds to pay for increased imports from the mature market countries.

relative to Europe and Japan are shaped more by long-term or by shorter-term performances. However, it is likely that the rate-of-return argument in favor of capital flows to the United States will weaken over time if the recent underperformance of U.S. equities and bonds persists.<sup>20</sup> Such underperformance could result from a turning of

the credit cycle in the U.S. corporate and mortgage markets, and could start to feed on itself, leading to overshooting, if so-called "stop-loss strategies" were to kick in. Naturally, there is a risk that if this overshooting occurs in an abrupt way, leading to widespread losses and an increase in market volatility, it could trigger a disor-

<sup>20</sup>In fact, some prominent U.S. mutual funds have recently announced that they will reduce exposures to U.S. equities in favor of international equities.

derly change in the flow of capital to the United States.

While the motivations of international investors are not fully understood, it is reasonable to say the following:

- Accumulation of U.S. dollar assets by the rest of the world at the present scale cannot go on forever—at some juncture, a saturation point would be reached after which international investors would want to diversify their portfolios. From the U.S. perspective, its external debt dynamic would become unsustainable.
- However, the international accumulation of U.S. assets could go on for some time, if the underlying regional pattern of saving and investment and the differences in the level of development of international financial markets persist.
- Since such characteristics of market structures change only slowly—absent a major global shock or politically motivated asset reallocation—it would be highly speculative to expect the current pattern of asset preferences to change abruptly and sharply in the near future, even though such a possibility exists.<sup>21</sup> Given the strong ties of a number of Middle Eastern surplus countries to the U.S. dollar, a shift of global current account surpluses to this region would not suggest any abrupt changes (see Box 1.6 in this issue of the GFSR and Chapter II of the April 2006 *World Economic Outlook*).

Nevertheless, the expected narrowing of favorable growth and interest rate differentials (for the United States) is likely to lead to some moderation in the pace of foreign accumulation of U.S. assets. This would weaken the dollar and push U.S. bond yields up somewhat. Of course, there is a risk of market overshooting during the transition period. If the prospect of more balanced growth around the world becomes firmer, helping to reduce

global imbalances, financial markets could “front run” such developments by reallocating assets away from the United States to areas such as Europe and Japan. This could sharply weaken the dollar and push up interest rates.

More important, sudden and negative developments—such as military confrontation, major terrorist attacks, a sharp fall in the supply of crude oil or other vital sources of energy, and maybe, more realistically, a significant rise in protectionism—could change the rational framework for global asset allocation and trigger a disorderly unwinding of global imbalances. These uncertainties, however, are difficult, if not impossible, to quantify. In a similar vein, and equally impossible to quantify, would be an outbreak of the avian flu pandemic. Such an event could have a serious disruptive effect on international financial systems—especially the payment clearing and settlement system—and the global economy (see Box 1.7).

### Assessment of Financial Stability and Policy Implications

To sum up, in the base case scenario of continued growth and contained inflation, financial systems—from a position of financial strength—should be able to cope with the envisaged cyclical risks rather well. For example, credit spreads would widen and volatility would increase only moderately, and market adjustments would generally remain orderly. Obviously, if the unwinding of the various imbalances were to signal lower-than-expected growth, markets would react more sharply; but there is little evidence from the above analysis to suggest that the expected or likely market corrections in the period ahead would lead to crises of systemic proportions.

The most likely cyclical setting for financial markets in 2006 could be defined as “not bad,

<sup>21</sup>Central Banking Publications (2006) recently reported the results of a survey of 56 central banks holding \$1.9 trillion of reserves, concluding that “reserves managers did not indicate a strong desire to switch out of U.S. dollar holdings.”

### Box 1.7. Financial Implications of an Avian Flu Pandemic

An avian flu pandemic could affect the global financial system through (1) operational disruptions caused by a sharp increase in worker absenteeism in the financial industry and (2) market disruptions and changes in capital flows resulting from an increase in risk aversion. The magnitude and duration of these disruptions would depend on the severity of the pandemic and on the degree of preparedness.<sup>1</sup>

#### *Operational Risks*

Operational risks constitute the single largest set of risks in the event of a pandemic. High absenteeism could result in disruptions of the critical functions and services of the financial system, including payments, clearing and settlements, trading, and IT and communication infrastructure. Such operational disruptions could prevent transactions from being completed and obligations from being met. Moreover, disruptions in one jurisdiction could spread to other jurisdictions, leading to disorderly changes in asset prices and capital flows in countries not yet directly affected by the avian flu pandemic.

In recent years, financial institutions, central banks, and regulators have adopted business continuity plans (BCPs) to deal with terrorism and natural disasters. However, planning for a pandemic, with widespread absenteeism and health concerns, has been limited. A number of large financial institutions have now extended their plans to deal with an avian flu pandemic by identifying noncore activities, and planning for work from home, heavy demand for cash by the public, and transport of key personnel whose functions cannot be done from home. However, the level of preparedness varies greatly across financial institutions and among national authorities.

Note: The main authors of this box are Charles Blitzer and David Hoelscher. The box was jointly prepared by the International Capital Markets Department and the Monetary and Financial Systems Department of the IMF.

<sup>1</sup>See *World Economic Outlook* (April 2006) for a discussion of the potential impact of a pandemic on the real economy and on global trade.

#### *Market Disruption Risks*

The outbreak of avian flu could threaten global financial markets. A sharp increase in risk aversion could occur, resulting in increases in demand for liquidity, specifically for cash and for low-risk assets. This “flight to quality” would lead to declines in equity values and a widening of credit spreads for both corporations and emerging markets. Given that an avian flu pandemic would be expected to spread rapidly around the world, similar asset price adjustments are likely to occur across regions. Although these effects are likely to be temporary, and their magnitude will depend on the severity of the pandemic, such asset price declines could put the balance sheets of some financial institutions under stress and challenge their ability to comply with regulatory norms. Market disruptions could become more disorderly in the case of a breakdown in the market infrastructure leading to limited and/or intermittent trading.

A pandemic may also lead to a significant but temporary reduction in net capital flows to emerging markets. Some capital flight from residents seeking safe havens could be expected. Based on the SARS experience, FDI plans may change little, although the timing of major investments may be postponed. A shift in risk preferences could lead to modest portfolio outflows, particularly from members with relatively high-priced equities, or with weaker public finances, and/or with current accounts highly dependent on commodity prices and export of services. However, to varying degrees, members would be able to address temporary balance of payments pressures by drawing on reserves, which for many countries are at a historical high.

#### *Policy Responses*

To minimize financial sector disruptions, national authorities, including regulators, should take preemptive measures and provide guidance on the contents of BCPs, outlining best industry practice. They should review BCPs for adequacy and consistency. In addition, all banks and national authorities should test

their BCPs, assessing whether essential functions can continue over a sustained period in the event of potentially very high absentee rates, ensuring that back-up equipment, data centers, and telecommunication networks are adequate to deal with a surge in remote access activities (including online banking and work from home) and that institutions can meet sharp increases in liquidity preference. Some countries have established emergency committees composed of government, public health, central bank, and regulatory officials for decision making in the event of an avian flu pandemic. Finally, a communications strategy, both within the country and with international contacts, should be developed. A good communications strategy will help minimize market overreaction.

Authorities should be prepared to accommodate a surge in liquidity demand and shock-related price increases. In particular, central banks will need to ensure adequate supplies of cash notes and the capacity to deliver them. To calm markets and avoid forced selling into falling markets, financial regulators may have to consider a degree of prudential forbearance. For instance, liquidity requirements, solvency regimes, audit regulations, and provisioning requirements could be temporarily eased, and audit requirements could be adjusted for a work-from-home environment. To contain asset price deflation, regulators, including those regulating the insurance and pension industries, may have to consider temporary forbearance where prudential limits are breached by an initial decline in asset prices.

but not as good as the stellar year 2005.” The earnings capacity for systemically important financial intermediaries might be inferior to last year’s, especially if default rates and credit spreads were to rise somewhat, equity markets were to become softer, and flat yield curves were to make carry trades of all kinds more difficult. But it is difficult to make a case that realistic economic developments all by themselves could—at least over a 6–12 month time horizon—seriously affect the global financial system in a systemic way.

If cyclical changes were indeed to expose some weaker, but nonsystemic, spots, such as idiosyncratic credit risks or poor risk management in a number of individual cases, from a macroprudential point of view the present time is an ideal occasion to let the self-correcting forces of the market work out price dislocations by adhering to a strict no-bailout policy. Regulators and supervisors would have an almost unique opportunity to

contain complacency and ultimately moral hazard. If certain investors, such as hedge funds, were to experience difficulties, it would be important to “let nature take its course” and let individual investors suffer losses. The transfer of risk, at least in part, to the household sector has somewhat changed the nature of moral hazard from “too big to fail” for some key financial institutions to whole market segments being “too important to fail.”<sup>22</sup> Hence, the combination of solid resilience of the financial system in general and some potential weak spots here and there exposed by cyclical deteriorations present authorities with an occasion to reinforce market discipline as a key parameter for the pricing of various risks. At a time when markets may become weaker, especially in pockets of high valuations and low risk premiums, it is important to let investors experience a two-way market. During a long period of stability, especially if accompanied by a generational

<sup>22</sup>See IMF (2005).

change among traders, asset managers, and risk officers, the appreciation for the public sector's "tough love" approach—no bailout in any shape or form in case of financial risks materializing—might get lost and merits a reminder.

The structural changes in the financial sector laid out above permit authorities to behave more robustly in the case of asset repricings. With the exception of the mentioned "tail risks," one can expect the self-correcting forces of financial markets, especially the increasing diversity of investors and their investment horizons, to take care of most risks. Apart from the regular microeconomic "supervisory vigilance," complemented by a number of more specific and detailed recommendations mentioned below, and apart also from the macroeconomic policy advice contained in the *World Economic Outlook*,<sup>23</sup> it is hard to see what other macroprudential policies could be recommended to further bolster the resilience of global financial stability. As usual, of course, macroeconomic policies that aim for solid and well-balanced global growth also underpin the strength and resilience of the financial system.

Capital markets—especially for new products such as credit derivatives—have become ever more important in financial intermediation. As a consequence, and rightly so, international financial regulatory efforts have focused on improving standards for disclosure, transparency, corporate governance, and risk management so as to help markets function smoothly. Against that background, the proper policy focus at present should not be on developing new regulations that could stifle innovations, but rather on effective surveillance and supervision—in particular the implementation of already-announced measures, such as Basel II and the new interna-

tional financial accounting and reporting standards. Given the complexity of financial markets and products, supervisory authorities need to continually narrow the gap between themselves and the ever-advancing financial markets; this is the most crucial prerequisite for making informed and timely assessments of risks and vulnerabilities in financial systems.

Supervisors should specifically encourage further improvements in the robustness of market infrastructures. The recent supervisory initiative (see Chapter II) to prod market participants to take steps to reduce the confirmation backlog in credit derivative trades is a welcome example. Also to be welcomed are various private sector market initiatives, including work to develop a cash settlement protocol for credit derivative contracts, recommendations by the Counterparty Risk Management Policy Group II, the Group of Thirty (G-30) Plan of Action for Global Clearing and Settlement dating back to 2003, and the G-30 study on "Reinsurance and International Financial Markets." All recommendations should be implemented by market participants without delay. Market participants and supervisors alike should continue to improve corporate governance, disclosure, transparency, and the integrity of financial statements to reduce the scope for "surprises" about the true health of corporate balance sheets—it was largely surprises, or unanticipated shocks, that caused many crises in the past.

As the GFSR has emphasized in the past, sound macroeconomic policy, especially prudent fiscal policy and flexible exchange rates, is essential to reduce vulnerabilities. At the same time, the recent evidence from EM countries clearly points to active debt management programs as playing a significant role in

<sup>23</sup>According to the April 2006 *World Economic Outlook*, "a coordinated package of policies across major regions—including measures to reduce the budget deficit and spur private savings in the United States; structural and other reforms to boost domestic demand in surplus countries; and greater exchange rate flexibility in China and some other countries to allow necessary appreciations to take place—could significantly reduce risks."



reducing vulnerabilities. The types of operations that a wider group of countries could consider include using reserves above prudential requirements to buy back external debt, market-based exchanges of foreign currency debt for local currency debt, and gradual lengthening of the yield curves even when they are modestly upward sloping. A number of countries could benefit from improved investor relations programs, including through enhanced data transparency. And, finally, low-income countries, which are just beginning to attract significant interest from foreign investors, will need to consider how best—including through avoidance of over-borrowing and development of debt management programs—to protect their balance of payments and financial sectors from perhaps swift changes in investor sentiment.

Emerging market countries, as a group and certainly the large, systemically important ones, have better access to international investors than ever before, be it on international markets or increasingly in domestic markets. Again, emerging market countries, as a group and mostly large ones, have been net exporters of capital to the rest of the world for six consecutive years and many countries have reduced the supply of their external sovereign debt, and therefore can facilitate access to international capital markets by EMs with current account deficits. Idiosyncratic risk events could still materialize (i.e., small countries with weak fundamentals could experience funding difficulties) but will not easily trigger financial contagion that would threaten to curtail emerging market countries' access to international capital markets in general.

In addition to more traditional cyclical and structural risks, financial systems at the global and national levels are also vulnerable to event risks such as terrorism or an avian flu pandemic. Such events have the potential to disrupt the normal operations of financial systems and to undermine market confidence, with negative consequences for financial stabil-

ity. Largely because the probability and the severity of these risks are highly uncertain, risk managers generally have paid less attention in assessing their balance sheet risks. On the other hand, event risk is an important component of business continuity planning and, since 2001, significant progress has been made by financial institutions and national authorities to plan for terrorist events. However, concerns about an avian flu pandemic, which would create somewhat different challenges, are just coming to the fore. Such a pandemic could affect the global financial system through operational disruptions caused by a sharp increase in worker absenteeism, a surge in demand for liquidity and cash, and a decline in asset prices (see Box 1.7). Policymakers will need to ensure that their financial systems are adequately prepared for such disruptions so that core financial services remain operational.

As an urgent matter, regulators should provide guidance on the content of business continuity plans. They should ensure through testing that essential functions can continue in the event of significant absentee rates, that institutions can meet a sharp increase in liquidity preference, and that there is adequate international coordination. Finally, a communications strategy should be developed in advance of an avian flu pandemic to help minimize market overreaction. In the event of a pandemic, central banks will have to consider the appropriate extent of their liquidity operations, and regulators will have to determine an appropriate degree of prudential forbearance.

## Appendix: Emerging Market Financing Flows

Private capital flows to emerging markets are estimated to have hit record highs in 2005, surpassing the previous record of flows in 1996 before the Asian crisis. The flows have been supported by strong foreign direct investment, record issuance in global primary

markets (in both external and local currencies), record issuance of syndicated loans, and strong flows into local currency secondary markets (for both bonds and equities). This appendix reviews these developments.

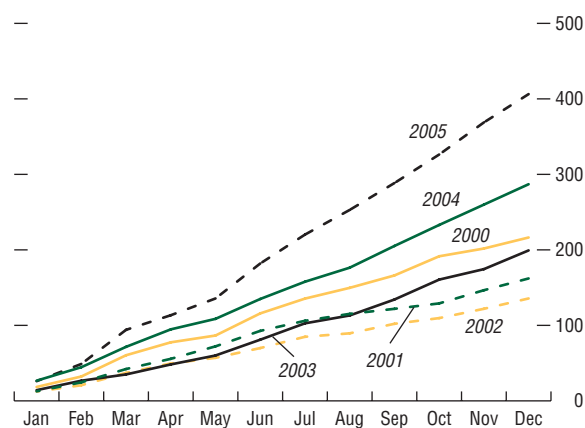
### Primary Issuance in External Markets

New issuance in emerging markets hit historic highs both in gross and in net terms in 2005 (Figure 1.20 and Table 1.4). Gross annual issuance of bonds, loans, and equities was \$406.4 billion in 2005, far surpassing the level of 2004 (\$286.9 billion), which was itself a record. The majority of new issuance was in bonds, as emerging market sovereigns and corporates took advantage of unusually favorable external financing conditions. Syndicated loans also increased substantially, reflecting increased activity by commercial banks in emerging markets. However, new issuance of equities, starting from a lower base, grew the most in relative terms.

Gross bond issuance was at a record high in 2005, reaching \$182.2 billion and exceeding the previous record for 2004 by 35 percent. Issuance was relatively evenly split between sovereigns and corporates (\$83.6 billion versus \$77.1 billion), and both grew substantially from their level in 2004. On a regional basis, Asia, Europe, and Latin America all saw growth, but Latin America saw the biggest increase in issuance (78 percent), related to the return of Argentina to capital markets after its debt restructuring early in the year (Figure 1.21). On a net basis, bond issuance was also at a record high, reaching \$116.8 billion, surpassing the previous high of \$96 billion in 1997 (Figure 1.22). New net issuance was evenly split between sovereigns and corporates. The most significant regional development was the very large increase in net issuance in Latin America in 2005 compared with previous years, again related to Argentina's return to the bond markets. Market practice for sovereign issuance of bonds has converged to a broad acceptance of collective

**Figure 1.20. Cumulative Gross Annual Issuance of Bonds, Loans, and Equity**

(In billions of U.S. dollars)



Source: Dealogic.

**Table 1.4. Emerging Market External Financing**  
(In billions of U.S. dollars)

	2000	2001	2002	2003	2004	2005	2004				2005				2006 <sup>1</sup>
							Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Jan.
<b>Gross issuance by asset</b>	<b>216.4</b>	<b>162.1</b>	<b>135.6</b>	<b>199.7</b>	<b>286.9</b>	<b>406.4</b>	<b>71.6</b>	<b>63.4</b>	<b>70.2</b>	<b>81.8</b>	<b>94.1</b>	<b>87.9</b>	<b>106.6</b>	<b>117.8</b>	<b>18.4</b>
Bonds	80.5	89.0	61.6	99.8	135.5	182.2	40.9	29.1	34.5	30.9	61.3	37.2	40.4	43.4	15.4
Equities	41.8	11.2	16.4	27.7	45.2	78.2	13.9	10.2	5.6	15.5	10.5	17.4	23.0	27.3	1.7
Loans	94.2	61.9	57.6	72.2	106.2	145.9	16.8	24.0	30.1	35.3	22.3	33.3	43.1	47.2	1.4
<b>Gross issuance by region</b>	<b>216.4</b>	<b>162.1</b>	<b>135.6</b>	<b>199.7</b>	<b>286.9</b>	<b>406.4</b>	<b>71.6</b>	<b>63.4</b>	<b>70.2</b>	<b>81.8</b>	<b>94.1</b>	<b>87.9</b>	<b>106.6</b>	<b>117.8</b>	<b>18.4</b>
Asia	85.9	67.5	53.9	88.8	123.7	150.4	34.1	28.5	25.8	35.4	26.7	33.5	40.7	49.5	5.9
Latin America	69.1	53.9	33.4	43.3	54.3	86.2	14.4	9.7	16.2	13.9	34.1	13.8	22.6	15.7	3.5
Europe, Middle East, Africa	61.4	40.8	48.3	67.7	109.0	169.8	23.1	25.2	28.3	32.5	33.3	40.7	43.2	52.6	9.1
<b>Amortization by asset</b>	<b>113.9</b>	<b>147.1</b>	<b>128.5</b>	<b>119.5</b>	<b>128.1</b>	<b>108.0</b>	<b>35.0</b>	<b>32.8</b>	<b>30.6</b>	<b>29.7</b>	<b>21.7</b>	<b>26.2</b>	<b>32.6</b>	<b>27.5</b>	<b>9.4</b>
Bonds	51.8	59.2	59.0	57.1	69.6	65.4	21.5	17.5	15.9	14.7	13.4	14.6	21.6	15.8	5.0
Loans	62.1	88.0	69.5	62.4	58.5	42.6	13.5	15.3	14.7	15.0	8.3	11.6	11.0	11.7	4.3
<b>Amortization by region</b>	<b>113.9</b>	<b>147.1</b>	<b>128.5</b>	<b>119.5</b>	<b>128.1</b>	<b>108.0</b>	<b>35.0</b>	<b>32.8</b>	<b>30.6</b>	<b>29.7</b>	<b>21.7</b>	<b>26.2</b>	<b>32.6</b>	<b>27.5</b>	<b>9.4</b>
Asia	56.6	66.2	55.7	45.5	49.8	38.7	13.2	12.9	11.8	11.8	8.1	5.9	11.4	13.4	3.8
Latin America	32.3	45.6	40.8	40.4	46.7	37.1	12.3	13.4	10.2	10.9	7.7	10.4	11.1	7.9	3.9
Europe, Middle East, Africa	24.9	35.3	32.0	33.6	31.6	32.2	9.5	6.6	8.6	7.0	5.9	9.9	10.1	6.3	1.6
<b>Net issuance by asset</b>	<b>102.5</b>	<b>15.0</b>	<b>7.2</b>	<b>80.2</b>	<b>158.8</b>	<b>298.4</b>	<b>36.6</b>	<b>30.6</b>	<b>39.6</b>	<b>52.1</b>	<b>72.4</b>	<b>61.8</b>	<b>74.0</b>	<b>90.3</b>	<b>9.1</b>
Bonds	28.7	29.9	2.6	42.7	65.9	116.8	19.4	11.6	18.6	16.2	47.9	22.6	18.8	27.6	10.3
Equities	41.8	11.2	16.4	27.7	45.2	78.2	13.9	10.2	5.6	15.5	10.5	17.4	23.0	27.3	1.7
Loans	32.1	-26.1	-11.8	9.8	47.7	103.3	3.3	8.7	15.4	20.3	14.0	21.7	32.2	35.5	-2.9
<b>Net issuance by region</b>	<b>102.5</b>	<b>15.0</b>	<b>7.2</b>	<b>80.2</b>	<b>158.8</b>	<b>298.4</b>	<b>36.6</b>	<b>30.6</b>	<b>39.6</b>	<b>52.1</b>	<b>72.4</b>	<b>61.8</b>	<b>74.0</b>	<b>90.3</b>	<b>9.1</b>
Asia	29.2	1.3	-1.8	43.3	73.9	111.7	20.8	15.6	13.9	23.6	18.6	27.6	29.4	36.1	2.0
Latin America	36.8	8.3	-7.4	2.9	7.6	49.1	2.1	-3.6	6.0	3.0	26.4	3.4	11.5	7.8	-0.4
Europe, Middle East, Africa	36.5	5.5	16.3	34.0	77.3	137.6	13.6	18.6	19.6	25.5	27.4	30.8	33.1	46.3	7.5
<b>Secondary markets</b>															
<b>Bonds</b>															
EMBI global (spread in basis points)	735	728	725	403	347	237	414	482	409	347	373	297	235	237	210
Merrill Lynch high-yield (spread in basis points)	890	795	871	418	310	371	438	404	384	310	352	385	354	371	342
Merrill Lynch high-grade (spread in basis points)	200	162	184	93	83	92	94	97	91	83	93	95	89	92	90
U.S. 10-year treasury yield (percent)	5.12	5.05	3.82	4.25	4.22	4.39	3.84	4.58	4.12	4.22	4.48	3.92	4.33	4.39	4.52
(In percent)															
<b>Equity</b>															
DOW	-6.2	-7.1	-16.8	25.0	3.1	-0.6	-0.9	0.8	-3.4	-1.9	-2.7	-2.2	2.9	1.4	1.4
NASDAQ	-39.3	-21.1	-31.5	50.5	8.6	1.4	-0.5	2.7	-7.4	1.9	-8.2	2.9	4.6	2.5	4.6
MSCI Emerging Market	-31.8	-4.9	-8.0	51.2	22.4	30.3	8.9	-10.3	7.4	-0.2	1.8	3.0	17.0	6.8	10.9
Asia	-42.5	4.2	-6.2	46.1	12.2	23.5	7.6	-12.2	4.2	-0.5	2.9	2.8	8.5	8.6	7.5
Latin America	-18.4	-4.3	-24.8	66.7	34.8	44.9	6.2	-9.2	16.6	-1.1	1.9	7.1	29.5	2.7	17.0
EMEA	-22.3	-20.9	4.7	51.9	35.8	34.9	13.2	-7.4	7.8	1.0	-0.4	0.5	27.1	6.6	13.5

Sources: Bloomberg L.P.; Capital Data; JPMorgan Chase & Co.; Merrill Lynch; Morgan Stanley Capital International; and IMF staff estimates.

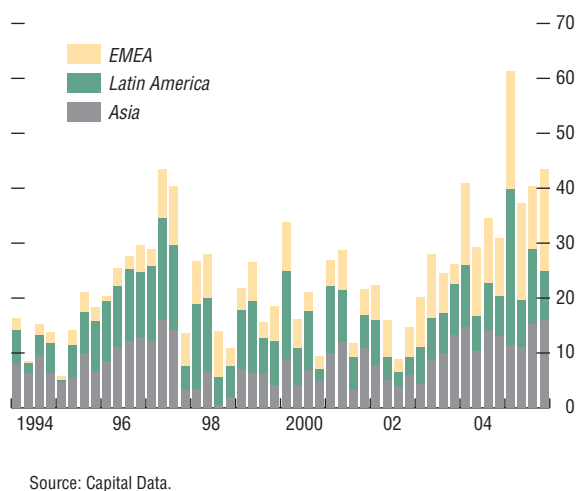
<sup>1</sup>Issuance data are as of January 31, 2006, close-of-business, London. Secondary market data are as of January 31, 2006, close-of-business, New York.

action clauses (CACs) in international issues under New York law (Box 1.8, p. 46).

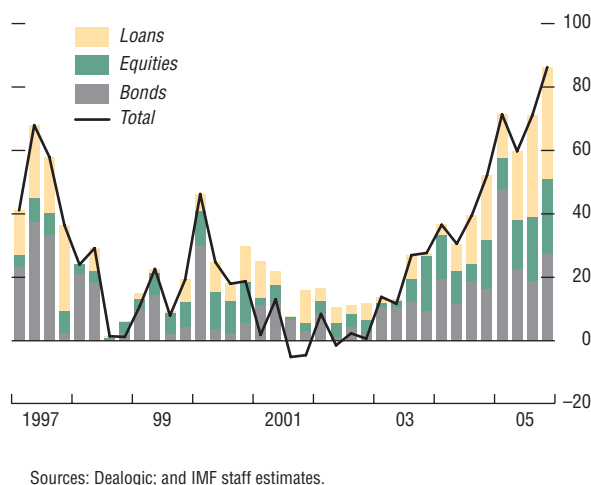
Net issuance by corporates in international markets doubled in 2005, reflecting increased risk appetite by investors and a continued releveraging of balance sheets by emerging market corporates after the financial crises of

the late 1990s and early 2000s. The increase in net issuance by corporates started in 2003 and has accelerated significantly since then. By region, Asia and Europe, Middle East, and Africa (EMEA) dominate, with Korean and Chinese firms (largely trading companies and banks) dominating in the former, and

**Figure 1.21. Gross Bond Issuance**  
(In billions of U.S. dollars)



**Figure 1.22. Quarterly Net Issuance**  
(In billions of U.S. dollars)



Russian banks and oil companies in the latter.

A large part of the issuance of bonds by sovereigns in 2005 represented prefinancing of 2006 sovereign external issuance needs. Including issuance during the first month of 2006 (about \$8 billion), total financing already undertaken to meet 2006 needs is estimated at \$24.6 billion, against a total sovereign planned issuance of \$54 billion. Emerging market sovereigns had thus met almost half of their issuance needs for the year by the end of January 2006. On a regional basis, most Latin American countries had completed 100 percent of their issuance needs, and a number of sovereigns were beginning to prefinance 2007, while emerging Asia had met 24 percent and emerging Europe about 37 percent.

Syndicated loan commitments also hit a record high in 2005 (Figure 1.23). In gross terms new syndicated loans reached \$145.9 billion, substantially above the previous peak of \$122 billion in 1997. Regionally, the largest increase in syndicated lending has been channeled to the Middle East, which more than doubled from \$11.5 billion in 2004 to \$36.3 billion in 2005. European emerging markets also had a large increase, related to financing of Russian corporates. In general, cross-border lending to emerging market corporates has increased substantially as commercial banks have sought to build relationships in these countries to take advantage of expanding business opportunities in other fee-generating areas. In addition, some of the activity is related to the refinancing of previous projects, under which banks recycle the same money with the same clients at lower margins and a longer tenor.<sup>24</sup> However, net issuance figures show that even taking this effect into account, flows were at historical highs, with net inflows of syndicated loans in 2005 at \$103 billion well exceeding the previous high of \$82 billion in 1997.

<sup>24</sup>Institute of International Finance (2006).

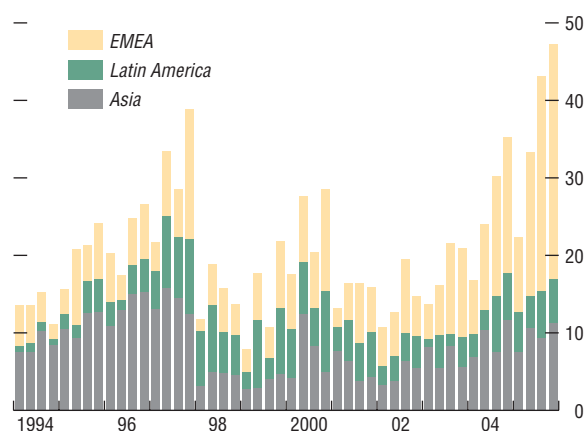
Equity issuance grew the most out of all primary capital flows to emerging markets, rising 73 percent to \$78.2 billion in 2005 over that of 2004 (Figure 1.24). As in past years, equity issuance was dominated by Asian countries, and in particular China, where initial public offerings raised over \$21 billion. China Construction Bank's IPO, which took place in October, was the largest ever initial public offering by a bank and the largest IPO since 2001. European equity issuance followed a distant second, dominated by Russian IPOs. In Latin America, IPOs have been relatively more active in Brazil and Mexico.

### Foreign Investor Flows into Local Markets

International investor interest in local markets, in both equities and bonds, continues to accelerate, pushed by the search for yield and diversification. Investment in local market instruments has been facilitated by improving fundamentals in many emerging market countries, as well as the inclusion of local currency government bonds from emerging markets in standard benchmark indices (the Lehman Aggregate, for example) and the development of new index products (such as the JPMorgan GBI-EM index) designed specifically to benchmark funds investing in local market government bonds.<sup>25</sup>

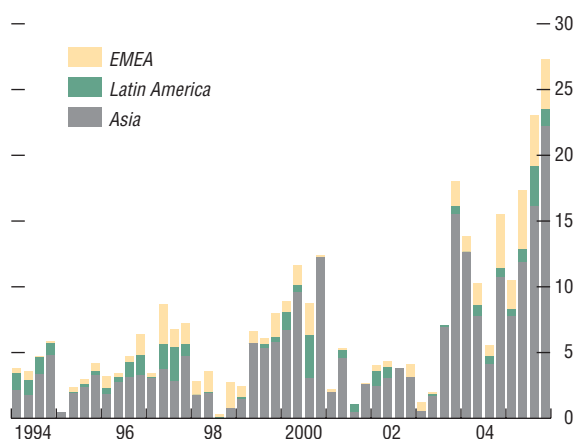
Initially the move into higher-yielding local markets was spearheaded by speculative investors. However, dedicated emerging market investors are increasingly setting up local market funds to invest in local cash bond markets. Fixed-income investor surveys suggest that investors are raising their benchmark exposure to emerging market local debt to 30 percent of assets. At the margin, this has required that as much as 80 cents per dollar of new money be dedicated to buying local

**Figure 1.23. Syndicated Loan Commitments**  
(In billions of U.S. dollars)



Source: Dealogic.

**Figure 1.24. Equity Placements**  
(In billions of U.S. dollars)



Source: Dealogic.

<sup>25</sup>For more on the drivers for local market investments, see Chapter III. In addition, see IMF (2005, Box 2.3): "Foreign Investment in Local Currency Instruments: A Cyclical or Fundamental Phenomenon?"

**Box 1.8. Collective Action Clauses**

Market practice has converged toward broad acceptance of the use of collective action clauses (CACs) in international sovereign bonds issued under New York law. With only two exceptions, all sovereigns that have issued under New York law since May 2003—26 emerging market countries and one mature market country—have included CACs in their bonds (see the table below). In 2005, more than 95 percent of new issues, in value, included CACs, while the share of bonds with CACs of the outstanding stock of sovereign bonds of emerging market countries climbed to around 57 percent as of January 23, 2006.

Since September 2005, emerging market countries have continued with their established

practice of including CACs in their international sovereign bonds issued under New York law. Three emerging market issuers—Ecuador, Iraq, and Vietnam<sup>1</sup>—included these clauses in their bonds for the first time, while 12 other emerging market issuers—Brazil, Colombia, Indonesia, Korea, Lebanon,<sup>2</sup> Panama, Peru, the Philippines, Poland, Turkey, Uruguay, and Venezuela—continued their practice of including these clauses in their bonds governed by New York law. Italy was the only mature market country to issue under New York law. Jamaica was the only country

<sup>1</sup>The Vietnam bond includes only majority restructuring provisions.

<sup>2</sup>The Lebanon bond includes only majority restructuring provisions.

Note: The author of this box is Luisa Zanforlin.

**Emerging Market Sovereign Bond Issuance by Jurisdiction<sup>1</sup>**

	2003				2004				2005				2006 <sup>2</sup>
	Q1	Q2 <sup>3</sup>	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2 <sup>4</sup>	Q3	Q4	Q1
<b>With CACs<sup>1</sup></b>													
Number of issues	9	31	10	5	25	19	19	15	18	38	12	24	6
Of which:													
New York law	1	22	5	4	14	12	12	13	11	22	10	19	5
<i>(In billions of U.S. dollars)</i>													
Value of issues	5.6	18.0	6.4	4.3	18.5	15.9	10.7	9.1	22.3	34.1	11.9	15.3	8.5
Of which:													
New York law	1.0	12.8	3.6	4.0	10.6	9.5	6.5	7.7	11.1	19.2	10.4	12.8	7.3
<b>Without CACs<sup>5</sup></b>													
Number of issues	14	4	7	7	2	1	1	4	0	1	1	1	0
<i>(In billions of U.S. dollars)</i>													
Value of issues	8.1	2.5	3.5	4.2	1.5	0.1	0.2	2.7	—	0.3	1.3	0.3	0.0

Source: Dealogic.

<sup>1</sup>English and Japanese laws, and New York law where relevant.

<sup>2</sup>Data as of January 23, 2006.

<sup>3</sup>Includes issues of restructured bonds by Uruguay.

<sup>4</sup>Includes issues of restructured bonds by Argentina and the Dominican Republic in their respective debt exchanges.

<sup>5</sup>German and New York laws (includes reopenings of previously issued bonds without CACs).

currency investments. These purchases are largely limited to the cash market because of investor mandates that restrict the use of derivative products.

The issuance of local currency external bonds continues to be an important development. Many local currency bond markets are difficult to access because of high transaction

that did not include CACs in its New York law-issued bonds.<sup>3</sup>

Following standard market practice, all issues under English and Japanese laws included CACs. Emerging market issuers under English law were Barbados, Hungary, Israel, Macedonia, Poland, Turkey, and Ukraine, while the mature market issuers were Austria and Sweden. Poland was the only issuer under Japanese law.

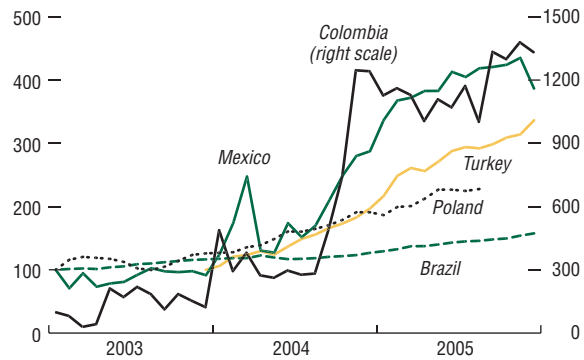
As before, the inclusion of CACs did not have any observable impact on the price of emerging market sovereign bonds governed by New York law. In recent discussions with the IMF staff, market participants suggested that the favorable conditions in global financial markets and generally sound economic policy stance of emerging market countries have made the inclusion of CACs in international bond contracts a neutral factor in the pricing of these bonds. They also noted that, since CACs have not played a major role in any restructuring of sovereign bonds governed by New York law, the market has not been able to determine the value of the inclusion of CACs on bonds' recovery prices. However, many market participants stressed that CACs could still affect the pricing of bonds if a sovereign debtor were to come close to a default or decide to use CACs in a restructuring of its bonds, particularly if the majority of this sovereign's outstanding bonds contain CACs. In this vein, CACs could be viewed as an option in a bond that would be in-the-money only when a sovereign issuer facing debt-servicing difficulties is near default.

<sup>3</sup>Egypt did not include CACs in its September 2005 bond issued under New York law, which is fully guaranteed by the United States with respect to principal and interest.

costs for both entry and exit. For example, a number of Latin American countries (including Argentina and Colombia) require a minimum holding period in the country before

**Figure 1.25. Nonresident Holdings of Local Government Bonds**

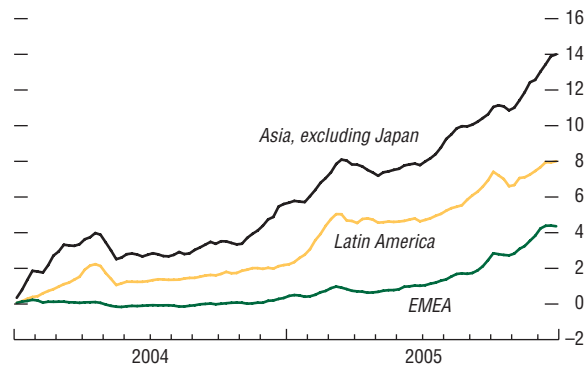
(Rebased, January 2003 = 100)



Sources: National authorities; and IMF staff estimates.

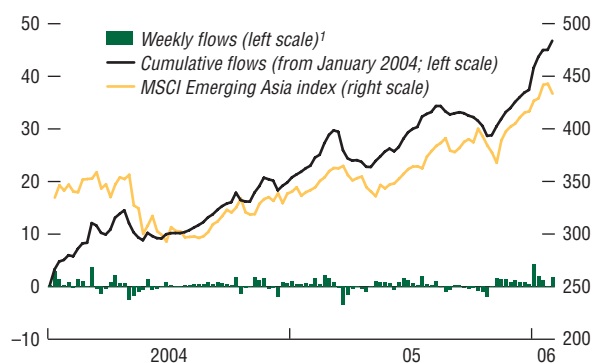
**Figure 1.26. Cumulative Net Inflows into Emerging Market Equity Funds**

(In billions of U.S. dollars)



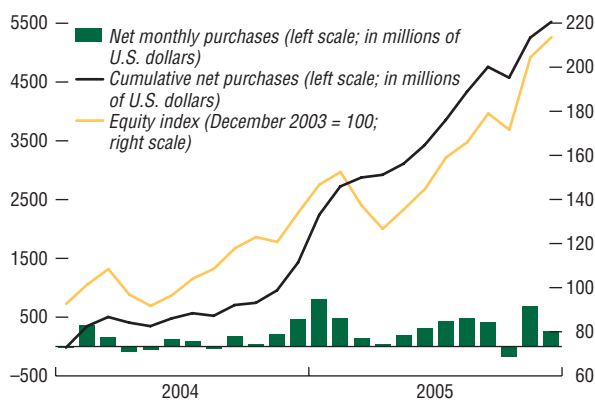
Sources: Emerging Portfolio Fund Research, Inc.; and IMF staff estimates.

**Figure 1.27. Flows into Asian Emerging Market Equities**  
(In billions of U.S. dollars)



Sources: Bloomberg L.P.; and IMF staff estimates.  
<sup>1</sup>Includes flows into Indonesia, Korea, Philippines, Taiwan Province of China, and Thailand.

**Figure 1.28. Turkey: Foreign Investment in the Stock Market**



Sources: Bloomberg L.P.; and IMF staff estimates.

local market investments can be liquidated, and others, such as Brazil, include foreign exchange transaction taxes for the liquidation of investments held within the country for less than 90 days. In addition, these countries and others have capital gains and financial transaction taxes that make active trading in local bond markets expensive for foreigners. One way in which sovereign and corporate issuers have overcome this problem for their external investor base is by issuing local currency bonds in global markets.

As more traditional investors move into emerging market cash bond markets, there has been a further search for yield in more exotic local markets. African government bonds have become more sought after, for example, with investor interest not just by speculative money, but also from foreign dealers, in countries such as Kenya, Nigeria, Tanzania, Botswana, Zaire, and Malawi. In addition, interest in local corporate bond markets has increased, though these markets are generally not very liquid.

Only incomplete data exist on foreign investor flows into local bond markets, but they confirm evidence from investor surveys that there is a significant new allocation into local markets. Data on holdings of local government bonds by nonresidents show significant increases in Mexico, Brazil, Poland, Turkey, and Colombia, particularly starting in 2004 and continuing through the end of 2005 (Figure 1.25).

Foreign investment flows into emerging market equities have also increased significantly, pushing up the value of local stock indexes. With a paucity of marketable debt, Asia has traditionally dominated as a destination for emerging market equity investors. But flows into Latin America and EMEA have also accelerated rapidly in 2005 (Figure 1.26). At the end of 2005, there was an acceleration of equity investment flows into emerging Asia stock markets driven by global growth plays, the turn in the tech cycle, and expectations of some recovery of local demand in the region



(Figure 1.27). Since the middle of 2004, equity valuations have moved in tandem with foreign investor inflows suggesting that foreign investors are an increasingly important segment of the market.

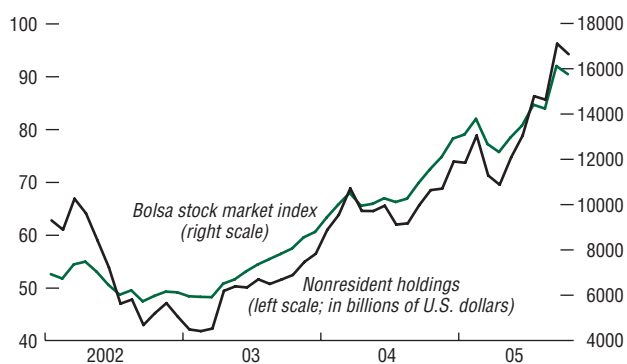
Major equity markets in other regions have also started to move in tandem with foreign investor flows, suggesting this may be a more generalized phenomenon for emerging markets. Equity markets in Turkey, Brazil, and Mexico all hit historical highs at the end of 2005, with the data indicating that these increases in valuation were increasingly driven by foreign investor inflows (Figures 1.28, 1.29, and 1.30).

The sharp rise in oil prices has also fueled a surge in equity markets in the Gulf Cooperation Council countries. Among the more important bourses in the region, the Saudi Arabian equity index, which is the largest and most liquid, rose 105 percent in 2005 and was up 15 percent by the end of January 2006.

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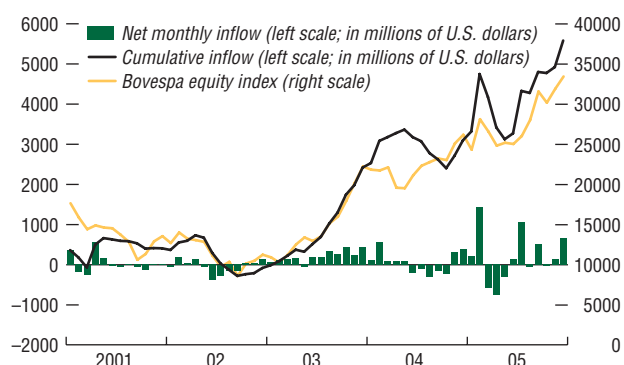
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**Figure 1.29. Mexico: Nonresident Holdings of Local Equities**



Sources: Bloomberg L.P.; and IMF staff estimates.

**Figure 1.30. Brazil: Foreign Investment in the Stock Market**



Sources: Bloomberg L.P.; and IMF staff estimates.

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