

# STABILITY IMPLICATIONS OF GLOBAL FINANCIAL MARKET CONDITIONS

As mentioned in Chapter I, during 2001 the international financial system has shown remarkable resilience in the face of sizable disruptions. Moreover, recent economic data seem to support market expectations that the global economy will recover soon. Nevertheless, for the purpose of identifying vulnerabilities in international financial markets, this chapter considers the risks to international financial stability that could be associated with the potential financial fallout of several financial imbalances, which could be exacerbated by a subdued recovery. In light of accumulated financial imbalances that have not yet been worked off, the main uncertainties would seem to be associated with the resilience of household, corporate, and bank (and nonbank financial institution) balance sheets in the presence of the renewed declines in equity prices and deterioration in credit quality that might occur during a weaker-than-expected global recovery. If balance sheets are impaired and financial imbalances are aggravated as a result of such asset price adjustments during the recession, this could itself lead to a subdued recovery and could possibly delay it, which in turn could feed back to a further deterioration in financial conditions (and so on). This would lead to a less friendly operating environment for financial institutions, especially for those already weakened by the events of 2001, and to possible stress within the international financial system.

Another closely related source of risk derives from the ongoing structural transformation in global finance. Many such sources can—and in future issues of this report will—be identified. For the period immediately ahead, with credit deterioration still unfolding, the increasing re-

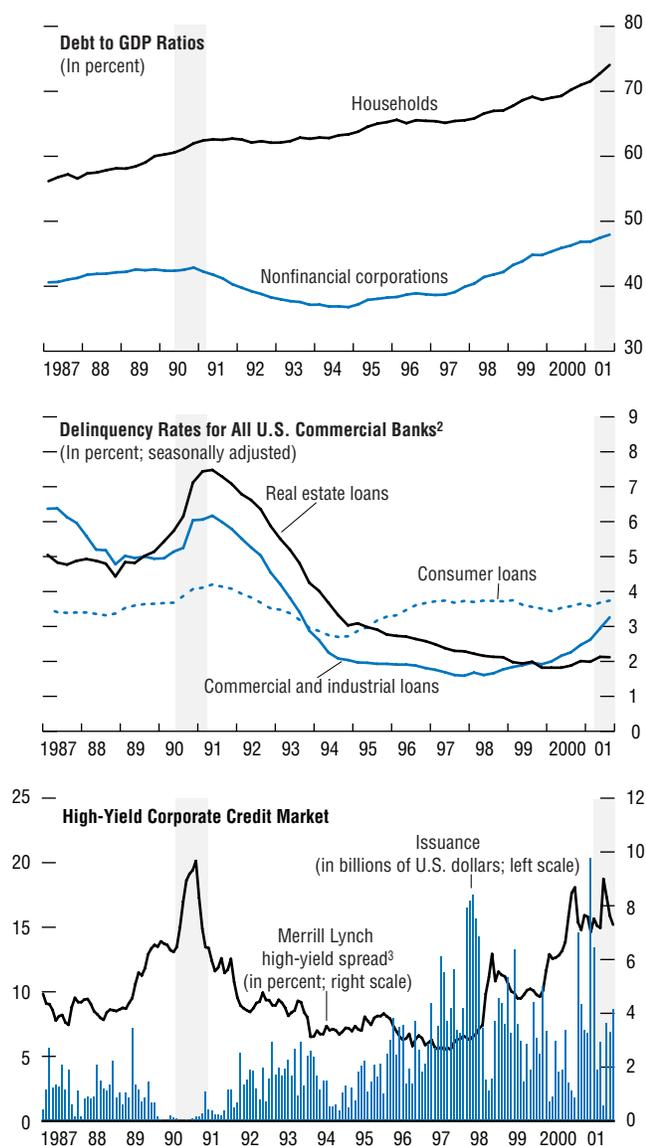
liance on credit risk transfer mechanisms could develop to be a source of financial market risk. The recent global rise in corporate debt defaults to historically high levels, and the relatively low degree of financial disclosure and market transparency about these instruments and markets—and about who owns the credit risk—would seem to pose some risk that market participants might have difficulty in accurately gauging the nature and extent of the credit deterioration. Even though these instruments and markets have coped fairly well with the events of 2001, it is still an open question how effectively they are working in the presence of a global slowdown and record high default rates.

## Financial Market Implications of Financial Imbalances and a Subdued Recovery

As analyzed in previous *International Capital Markets* reports, the structure of financial markets in the major international financial centers and the international financial system have changed significantly. So too have the linkages between economic activities and financial conditions. In this respect, one of the most significant structural changes in the past two decades has been the increased reliance by corporations and households on financial market instruments.<sup>1</sup> There has also been a corresponding increase in the dependence of households' and corporations' financial conditions—and accordingly, household and corporate spending—on movements in financial asset prices. In addition to the direct impact, this represents another transmission channel from movements in asset prices to the quality of banks' balance sheets. Accordingly, just as asset price adjustments have shaped the

<sup>1</sup>Chapter I in International Monetary Fund (2001a) examines household, corporate, and financial balance sheets; Dynan and Maki (2001) and Ludwig and Sløk (2002) discuss wealth effects. The latter paper finds that consumption in OECD countries can be about twice as sensitive to changes in stock market wealth than it is to changes in housing wealth.

**Figure 3.1. United States: Financial Conditions, 1987–2001<sup>1</sup>**



Sources: United States, Board of Governors of the Federal Reserve System; Bloomberg Financial Markets L.P.; and Merrill Lynch.  
<sup>1</sup>Shaded areas indicate recessions.  
<sup>2</sup>The delinquency rate for any loan category is the ratio of the dollar amount of a bank's delinquent loans in that category to the dollar amount of total loans outstanding in that category. These rates are calculated from the available data in the Report of Condition and Income (Call Report), filed each quarter by all commercial banks.  
<sup>3</sup>Spread against yields on a 10-year U.S. government bond.

strength and contours of the U.S. and worldwide expansion in the 1990s, they are also likely to determine the extent of the present global economic slowdown and later the pace of the recovery.<sup>2</sup>

**How Prevalent Were Financial Imbalances Before the Present Global Slowdown Compared with the Recession in 1990–91?**

In trying to assess the impact of the current recession on financial conditions, and the prospects for financial markets remaining resilient, it would be useful to have an historical perspective drawing on relevant experience and precedents. Unfortunately, given the changes in financial systems in the last two decades, there are few historical experiences of recessions that are useful for calibrating the international financial market implications of a subdued global recovery. This is particularly so given the greater effect that asset price adjustments are having on household and corporate balance sheets and financing compared with previous recessions. Such effects may be especially important to consider in view of the current conjuncture, which is characterized by accumulated corporate and household sector financial imbalances, a synchronized slowdown in the world's three largest currency zones, and significant global economic, financial, and political uncertainties.

In terms of financial market structure, and the dependence of balance sheets on financial asset prices, perhaps the only comparable recession is the U.S. recession of 1990–91. In the period leading up to the 1990–91 recession, both domestic and external financial imbalances had accumulated across a wide range of sectors, markets, and financial institutions—for exam-

<sup>2</sup>During the recent period, developments in the U.S. economy and financial markets seem to have played a key role in driving global economic and financial developments. See, for example, Arora and Vamvakidis (2001) for an empirical analysis of the apparently important “locomotive” role of the U.S. economy in global growth.

**Table 3.1. U.S. Financial Conditions During the 1990–91 and 2001 Recessions***(In percent, except where noted otherwise)*

	1990–91 Recession <sup>1</sup>			2001 Recession <sup>1</sup>	
	Pre-recession average	Recession average	Post-recession average	Pre-recession average	Recession average
<b>Banking system</b>					
Delinquency rates	5.1	5.8	4.0	2.2	2.5
of which:					
Consumer loans	3.5	4.0	3.4	3.6	3.7
Commercial and industrial loans	5.4	5.8	3.5	1.9	2.9
Real estate loans	5.0	7.1	4.9	2.0	2.1
Charge-off rates	1.13	1.35	0.93	0.64	0.87
of which:					
Consumer loans	1.59	2.03	1.88	2.43	2.64
Commercial and industrial loans	1.10	1.40	0.81	0.55	1.18
Real estate loans	0.54	0.94	0.67	0.08	0.19
Net income/assets	0.65	0.50	1.07	1.13	1.20
Noninterest income/assets	1.5	1.7	1.9	2.4	2.5
Equity capital/assets	6.3	6.6	7.8	8.5	8.8
Nonaccruals/loans	2.5	3.2	1.7	0.7	1.0
Reserves/nonaccruals	100	84	156	243	179
<b>Credit markets</b>					
Default ratio <sup>2</sup>	1.4	3.4	0.9	1.8	4.0
Defaulted debt (in billions of U.S. dollars)	4.1	22.4	3.4	30.5	115.0
Credit spreads (basis points)					
AAA	83	84	92	176	208
High-yield	624	826	573	691	764
<b>Household sector</b>					
Household debt growth	9.3	6.1	6.4	8.2	8.4
Debt/GDP	58.2	61.9	63.2	68.3	72.8
Debt service/disposable income	13.7	13.4	12.2	13.7	14.1
Net worth/liabilities	545.2	553.2	535.5	579.8	513.7
<b>Corporate sector</b>					
Corporate debt growth	8.3	1.7	4.1	10.8	5.8
Debt/GDP	41.9	42.6	37.7	43.9	47.4
Net interest/pretax income	21.7	23.9	12.8	13.1	14.0
Net worth/liabilities	119.5	104.4	91.9	100.6	93.9

Sources: United States Board of Governors of the Federal Reserve System; Fitch; Merrill Lynch; and Standard and Poor's.

<sup>1</sup>Except for credit spreads, pre-recession averages cover from 1987 or 1998 respectively. Recession averages cover recession period (July 1990–March 1991; March 2001–present) or nearest available window based on data frequency. Post-recession averages cover period through 1995. For credit spreads, pre- and post-recession averages cover a one-year period.<sup>2</sup>Percent of outstanding rated issues on which the obligor defaulted during the year (based on all issues rated by Standard & Poor's, including U.S. and overseas issuers).

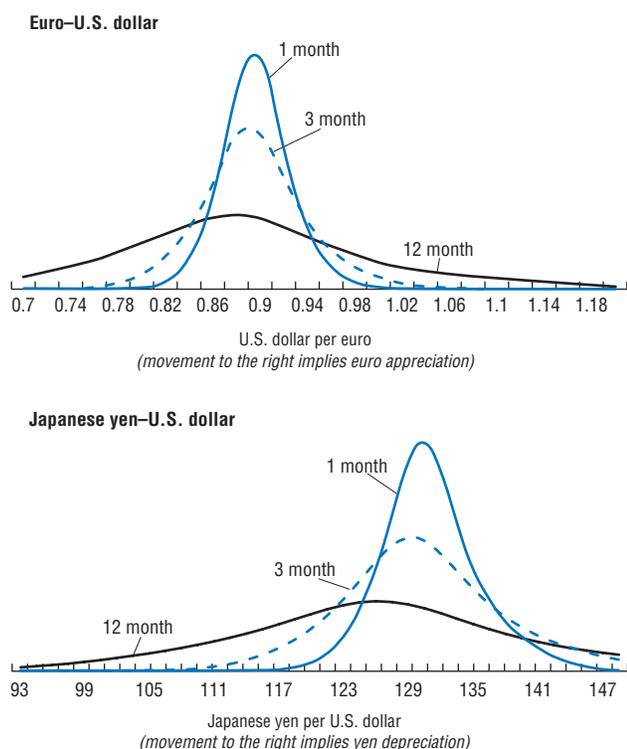
ple, in the U.S. junk bond market (recall the collapse of Drexel Burnham) and especially on bank balance sheets. Because of the domestic financial imbalances, and in particular in the banking system, the recovery from the U.S. recession in the early 1990s occurred against what U.S. Federal Reserve Chairman Alan Greenspan referred to as strong headwinds, and for this reason monetary policy remained relatively flexible and supportive of growth up until early 1994.

As might be expected, there are financial and economic parallels between the run-up to the 1990–91 U.S. recession and the period leading up to the present global slowdown and U.S. recession that began in March 2001 (Table 3.1 and Figure 3.1). The most relevant similarities are:

- a sharp slowdown of about 5 to 6 percentage points in U.S. economic growth;
- accumulated financial sectoral excesses (junk bonds and real estate in the 1980s and the

**Figure 3.2. Probability Density Functions for G-3 Exchange Rates Implied by Option Prices<sup>1</sup>**

(December 31, 2001)



Source: IMF staff estimates.

<sup>1</sup>Based on an assumed log normal distribution for exchange rates in which the mean equals the forward rate.

TMT sector in the 1990s) that adversely affected financial institution earnings and capital and caused market volatility in many countries;

- run-ups in U.S. corporate and household debt to cyclical highs relative to net equity, assets, and even GDP (for corporations, to a level that is 5 percentage points higher than in 1991, and for households, to 10 percentage points of GDP higher);
- sharp increases by U.S. banks in the cost of loans and tightening of loan standards; and
- record corporate bond defaults globally, including on investment-grade debt.

There are also important economic and financial *differences* in the current situation from 1990–91. *First*, the current slowdown is more globally synchronized than the previous one. Both Japan and the United States experienced recessions, European economies experienced weak growth, and economies in other regions have also experienced a recession or a slowdown in growth. Counterbalancing this to some extent are the much lower inflation and fiscal deficits in many countries, which provide degrees of policy flexibility, and the ample liquidity enjoyed by investors, which can be quickly moved to asset markets if sentiment improves.

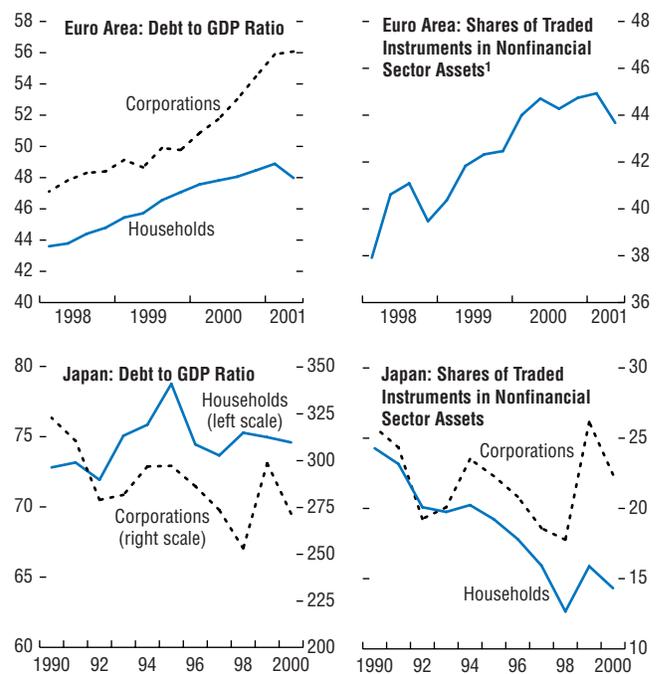
The recession in Japan—the world’s second largest economy—has restrained global growth and aggravated Japanese financial market imbalances and fragilities at a time when support for world demand would be beneficial. Several financial imbalances are worth noting. Government debt has grown to 140 percent of GDP and is projected to grow to over 150 percent of GDP in 2002, and this could pose financial risks in the Japanese government bond (JGB) market in the future (International Monetary Fund, 2001b, p. 44). Concerns about rising government debt have been reflected in downgrades of Japan’s sovereign ratings to Aa3 (Moody’s) and AA (S&P). Household debt has remained above 130 percent of disposable personal income. In the corporate sector, debt burdens remain high while at the same time asset price deflation and rising corporate bankruptcies are continuing to

weaken financial institutions' balance sheets.<sup>3</sup> Part of the reason is that corporations and financial institutions have not fully taken advantage of the various reforms implemented in Japan, as, for example, in bankruptcy laws, to address some of these imbalances and their root causes. As a result, they may not be able to contribute much to Japan's recovery when it materializes. Price movements in asset markets in Japan have also continued to strain household and corporate balance sheets. Finally, as suggested by market expectations extracted from foreign exchange options prices, the risks of a yen depreciation and appreciation seem to be equally likely (symmetric), with a high probability of a significant move ("fat-tailed") (Figure 3.2). It is possible that a depreciation might accompany further aggressive monetary easing. An appreciation could be triggered by simultaneous decisions by many Japanese investors to liquidate their substantial overseas portfolios (notwithstanding the relatively attractive returns available in overseas markets) and repatriate capital in order to finance corporate and financial sector restructuring.

In Europe, economic growth has slowed by more than anticipated, reflecting stronger-than-expected economic and financial linkages with the United States. For example, measures of European and U.S. financial conditions, such as equity prices and the profitability of financial institutions (including those that are active in both regions), have tended to move together. Looking ahead, rising debt burdens may act as a constraint on the recovery of growth in Europe: since 1997, household debt has risen from less than 44 percent to about 48 percent of GDP, while corporate debt has grown from about 47 percent to about 56 percent of GDP (Figure 3.3). Household debt in the United Kingdom and Germany has reached 117 and 115 percent, respectively, of disposable personal income,

**Figure 3.3. Household and Corporate Sector Balance Sheets in the Euro Area and Japan**

(In percent)



Sources: ECB; and Nomura database.

<sup>1</sup>Includes general government.

<sup>3</sup>The number of bankruptcies has risen sharply since the introduction of the Corporate Rehabilitation Act in April 2000.

**Table 3.2. Performance of Large European Banks**  
(In percent)

	1993	1994	1995	1996	1997	1998	1999	2000
<b>Asset quality</b>								
Nonperforming loans/gross loans	3.6	2.7	3.0	2.1	2.1	2.3	2.6	2.3
Net charge-offs/average gross loans	0.7	0.6	0.4	0.3	0.3	0.2	0.2	0.2
Loan loss reserves/nonperforming loans	88.8	118.2	96.0	111.3	100.0	99.0	94.7	89.8
Loan loss reserves/gross loans	3.2	3.2	2.9	2.3	2.1	2.3	2.4	2.0
Loan loss provisions/net interest revenue	32.3	17.8	15.0	13.1	15.2	19.0	15.4	12.9
<b>Capitalization</b>								
Equity/total assets	4.2	4.4	4.4	4.4	3.8	3.9	4.1	4.4
Equity/net loans	8.5	9.0	9.2	9.5	8.6	9.0	9.4	10.4
Equity/liabilities	4.5	4.7	4.7	4.6	4.0	4.2	4.3	4.7
<b>Revenue and profitability</b>								
Net interest revenue/average assets	2.0	2.1	1.9	1.8	1.6	1.5	1.3	1.2
Other operating income/average assets	1.3	1.2	1.2	1.5	1.5	1.4	1.4	1.7
Return on average assets	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.7
Return on average equity	9.7	12.7	12.0	11.5	11.4	12.6	13.7	16.0

Source: Bankscope; data for 30 largest European banks by assets.

compared with 106 percent in the United States.<sup>4</sup>

A second difference from 1990–91 is that in the period leading up to the present global slowdown, both U.S. and European banks were in relatively strong financial condition compared with prior years. This partly reflects the effects of the record-length economic expansion during 1991–2000, strengthened supervision and regulation, and improved private risk management. Accordingly, in the first half of 2001, U.S. bank income/assets and equity/assets ratios stood at 1.2 percent and 8.8 percent respectively, well above 1990–91 levels (Fitch, 2001). Similarly, charge-off and delinquency rates are half or less of those attained at the same point in the 1990–91 cycle. In 2000, the largest banks' returns on equity and on assets were at relatively strong levels by international standards (16 percent and 1 percent, respectively), broadly similar to their levels in 1993. Between 1993 and 2000, major European banks'

credit quality, profitability, and capitalization relative to assets all improved (Table 3.2). During that period, nonperforming loans (NPLs) declined from 3.6 percent to 2.3 percent of loans; charge-offs fell from 0.7 percent to 0.2 percent of loans; return on equity increased from under 10 percent to 16 percent; and equity as a percent of assets rose slightly to 4.4 percent.<sup>5</sup> However, the average figures for the largest European banks mask the poor performance of banks in the countries where the pace of consolidation and restructuring has noticeably lagged behind that of the United States and the European average. Those institutions have already struggled to cope with overcapacity and poor profitability in their home markets. Moreover, their efforts to diversify business overseas (to emerging markets countries) and into new business activities (such as lending to the telecom industry and engaging in credit derivatives businesses) have exposed them to new sources of weakness.

<sup>4</sup>Source: OECD. According to calculations by the Bundesbank, including non-incorporated enterprises (which are included in the German figures) in the U.S. figures increases the U.S. ratio to 142 percent.

<sup>5</sup>The crisis in Argentina will likely affect the profits of two major Spanish banks that have a local presence in the country. Nevertheless, credit rating agencies and bank analysts consider that losses will be manageable for these banks, because Argentina accounts for a relatively small share of their assets, and the banks have already set aside special reserves that cover the full amount of their Argentine banking equity investments.

**Table 3.3. Performance of Major Japanese City Banks<sup>1</sup>***(In percent, except where noted otherwise)*

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
<b>Asset quality</b>					
Nonperforming loans/loans	3.89	4.82	5.53	5.01	5.34
Credit expenses/average loans	1.25	2.78	2.90	1.32	1.36
Loan loss reserves/nonperforming loans	53.26	67.69	49.02	42.93	36.64
Loan loss reserves/gross loans	2.07	3.28	2.71	2.15	1.96
Loan loss provisions/net interest revenue					
<b>Capital</b>					
Equity/total assets	3.11	2.40	4.42	4.69	4.12
Equity/net loans	4.83	3.92	7.02	7.41	7.49
Equity/liabilities	3.21	2.46	4.62	4.95	4.30
<b>Operations</b>					
Net interest income/average assets	1.07	0.96	1.01	1.08	0.98
Other operating income/average assets					
Return on average assets (ROAA)	-0.01	-0.72	-0.57	0.15	-0.01
Return on equity (ROE)	-0.19	-29.93	-13.42	3.15	-0.32
<b>Loan portfolio (trillion yen)</b>					
International loans	71.3	60.8	40.8	29.2	28.3
Domestic loans	219.2	217.8	221.0	224.1	222.4
of which:					
Wholesale loans	64.4	64.9	72.5	67.6	68.4
Housing loans	36.2	38.9	40.7	41.8	41.6

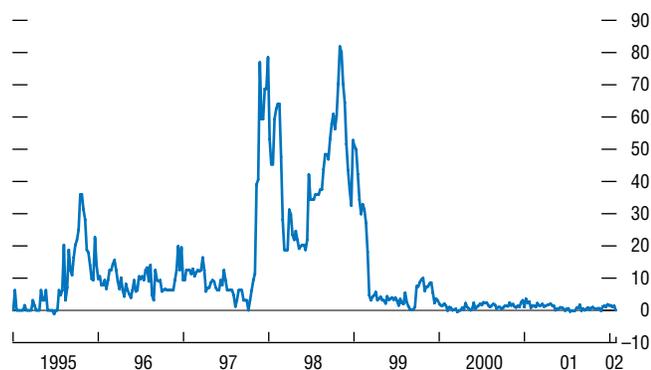
Source: Moody's Investors Service, Banking Statistical Supplement: Japan.

<sup>1</sup>Data for fiscal year ending in March.

Financial institution weaknesses are most pronounced in Japan. The cost of loan write-offs continues to exceed banks' operating profits, while reported NPL ratios have risen owing to the weak economy and tighter loan classification criteria (Table 3.3). During the first half of FY 2001 alone, major banks' NPLs increased by 13 percent from March 2001 to ¥22.5 trillion (\$275 billion). According to figures published by banks—which are lower than estimates by some market analysts—total banking system NPLs are about ¥43 trillion (\$320 billion), equivalent to about 8 percent of GDP, or roughly double the level present in the U.S. banking system during the 1980s S&L crisis. Japanese banks are also significantly exposed to market volatility through their equity holdings (equivalent to more than 150 percent of bank capital), as well as JGBs and swap holdings. At the same time, the zero interest rate policy has contributed to a further narrowing of spreads on corporate loans—the banks' traditional mainstay—and ongoing restructuring efforts have not yet significantly increased profits in other business areas. Mean-

while, insurance companies have been adversely affected by low premia, the negative spread between high guaranteed returns on life policies and low returns available in Japanese financial markets, and losses associated with the September 11 attacks (which caused the bankruptcy of one property and casualty insurance company). Notwithstanding these factors, life insurance companies reported ¥1.1 trillion in base profits during the first half of FY2001, owing to a more favorable demographic outturn than incorporated in actuarial assumptions.

Concerns about these problems seem to have mounted in the run-up to the planned withdrawal of blanket deposit insurance, which is intended by the government to demonstrate its commitment to reform. Confidence in the banking sector has sharply fallen, as reflected in a steep decline in bank stock prices and increased spreads on banks' yen bonds, dollar subordinated debt, and credit default swaps. In addition, the Nikkei's decline to an 18-year low has fed concerns about banks' losses on their large cross-shareholdings, particularly now that these

**Figure 3.4. Japan Premium<sup>1</sup>***(In basis points)*

Source: Bloomberg L.P.

<sup>1</sup>Average U.S. dollar LIBOR of Fuji Bank and Bank of Tokyo minus the LIBOR fix (three-month rate).

losses directly affect banks' already weakened capital following the introduction of mark-to-market accounting in April 2001. The Financial Services Agency (FSA) estimates that a 10 percent drop in the Topix would reduce major Japanese banks' capital ratio by about 0.4 percentage points. Nevertheless, the Japan premium, while rising in recent weeks, remains at low levels compared with past episodes of banking crises (Figure 3.4)—reflecting a perception that the government will support the banking system, and thereby replace the private risk of lending to Japanese banks with public-sector risk. In addition, the potential for stress in Japan's financial system to give rise to international spillovers may have declined. Major Japanese banks' international loan portfolios have contracted every year since FY 1996 (see Table 3.3), as they reportedly cut back overseas operations (adversely affecting markets). At the same time, and as noted above, the repatriation of capital by Japanese investors could affect conditions in international capital markets.

*Third*, U.S. household and corporate interest payments relative to income are below the peaks attained during (or in the run up to) the previous recession—partly reflecting today's lower nominal interest rates—although their debt service is higher relative to income (Figure 3.5). By the same token, interest burdens could rise if interest rates picked up amid an early recovery. *Fourth*, the levels of household and corporate net worth were boosted by asset price increases—including in real estate markets—during the last decade, although liabilities have grown more rapidly than net worth in both sectors, leading to a decline in the net worth/liabilities ratio. *Fifth*, despite mounting concerns about the dollar's overvaluation and large U.S. current account deficits, the dollar has continued to strengthen even as the U.S. economy has weakened and markets have become more volatile. This may reflect sustained capital inflows into the United States. In this environment, a change in foreign appetite for U.S. assets could affect the magnitude and composition of capital flows into the United States, leading to

asset price adjustments. *Sixth*, compared with investments during the 1980s junk bond and real estate booms, investments during the 1990s TMT boom may have had more fundamental, productivity-enhancing underpinnings and could therefore contribute more significantly to medium-term growth (as evidenced by 3.5 percent U.S. productivity growth during the fourth quarter of 2001). This may partly offset the negative wealth effect from the deflation in TMT stock prices that occurred during 2000–01.

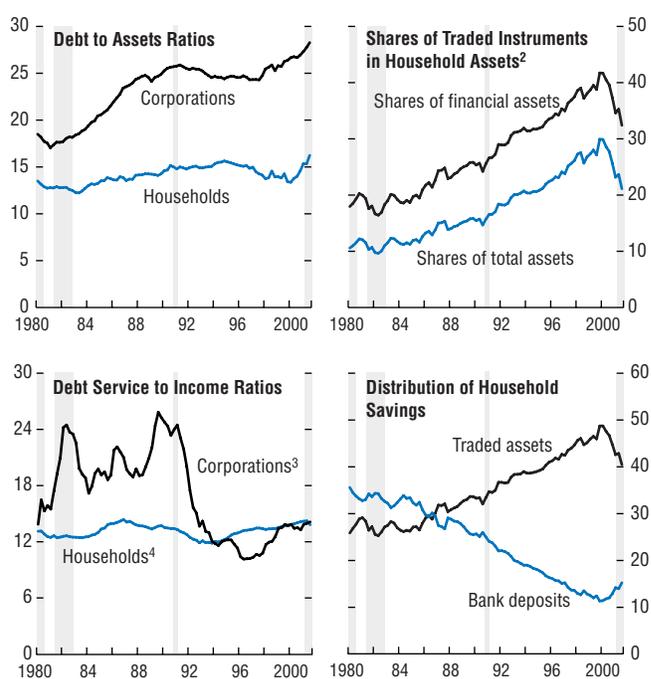
*Seventh*, a number of recent initiatives undertaken by the international community have worked to strengthen the international financial architecture and improve the functioning and stability of international financial markets. For instance, enhanced transparency and data dissemination have improved the scope for market analysts and international investors to discriminate between emerging market borrowers that have sound fundamentals and those that have relatively weak fundamentals. This improved discrimination would tend to reduce contagion from countries that experience crises owing to weak fundamentals.

Overall, the preceding analysis suggests that financial conditions during the period leading up to the present global slowdown were more favorable in many respects compared with those prevailing in 1990–91. But several weak links in the international financial system are present. The higher dependence of balance sheets on traded financial assets—in the context of greater indebtedness—is a potential source of risk.

### How Have Financial Conditions Deteriorated During 2001?

During 2001, global financial conditions have deteriorated across a broad range of markets, financial institutions, and sectors, but in some cases from a strong position (see Table 3.1). In addition to financial problems associated with the September 11 events and defaults by Argentina and Enron, bank delinquency and charge-off rates have increased somewhat for commercial and industrial, consumer, and real

**Figure 3.5. United States: Household and Corporate Sector Balance Sheets and Debt Service Ratios<sup>1</sup>**



Source: United States, Board of Governors of the Federal Reserve System.

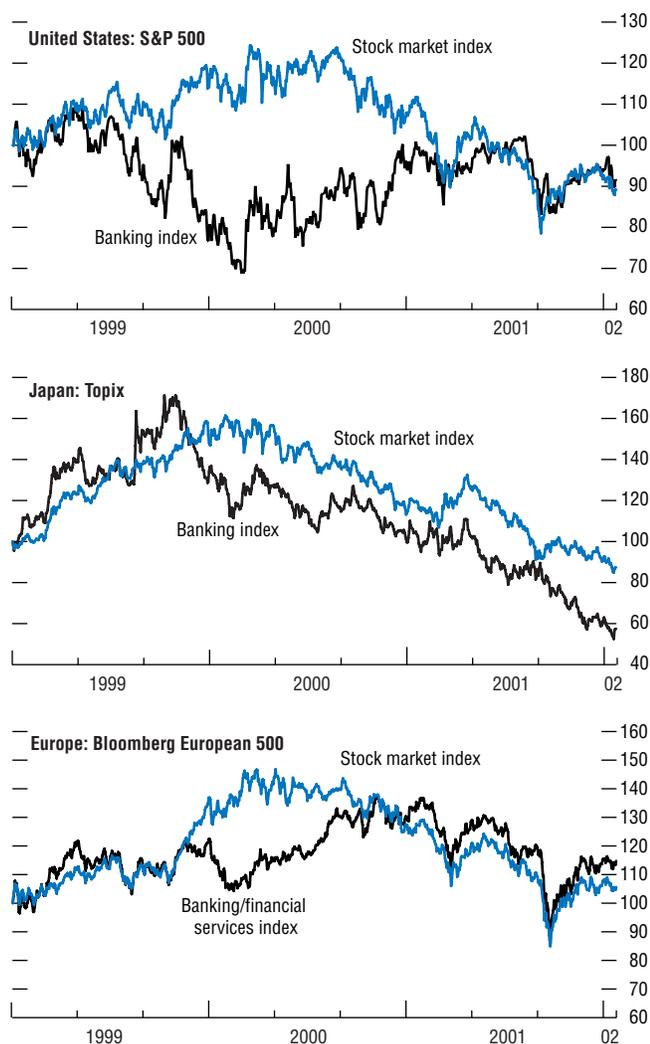
<sup>1</sup>Shaded areas indicate recessions.

<sup>2</sup>Credit market instruments, corporate equities, and mutual fund shares as a percentage of assets. Includes assets of nonprofit organizations.

<sup>3</sup>Ratio of nonfinancial corporate business net interest to pretax income.

<sup>4</sup>Ratio of household debt-service payments to disposable personal income.

**Figure 3.6. Performance of Bank Stock Indices**  
(January 1, 1999 = 100)



Source: Bloomberg L.P.

estate loans. Financial asset prices have also weakened on balance, as the performance of European and U.S. bank stock indexes has been lackluster, and Japanese bank stocks have fallen by over 40 percent (Figure 3.6). Broad stock market indexes fell during 2001, although markets recovered losses following the post-September 11 rebound. In the U.S. equity markets, price-earnings ratios ended the year at high levels that seem to be pricing in a mid-2002 global recovery (as discussed in Chapter II). In particular, they imply an increasingly optimistic outlook for U.S. corporate earnings growth (Figure 3.7), which contrasts with downward revisions to analysts' near-term earnings forecasts.

At the same time, and amid an unusually strong cyclical erosion in U.S. corporate profits as a share of GDP, credit market default rates have increased sharply to an average of almost 4 percent (they are normally in the range of 1 to 2 percent) exceeding those in 1990–91. The amount of defaulted debt reached a new annual record high of about \$115 billion in 2001 and a new monthly high of \$31 billion in January 2002. In addition, spreads on high-yield debt surged and peaked above 900 basis points in September 2001—only slightly below the peak reached in 1990–91. AAA spreads are presently 168 basis points and somewhat above 1990–91 levels. High-yield issuance has slowed sharply while investment-grade issuance has continued apace (see Chapter II).

Meanwhile, corporate and household debt have continued to rise relative to GDP, suggesting that these imbalances accumulated during the expansion have not yet been fully worked off. At the same time, aggressive reductions in interest rates and active mortgage refinancing activity have worked to limit upward pressure on corporate and household debt service. However, equity prices exhibited sharp price movements in 2001 in both directions, and, on balance, the net worth of U.S. households and nonprofit organizations has been reduced by about \$1.2 trillion as a result of equity price adjustments. More specifically, and based on an end-2000 equity-portfolio wealth of \$7.5 trillion, according to

U.S. flow-of-funds data, U.S. household and non-profit organizations experienced a capital loss of \$1.1 trillion in the first quarter of 2001, a capital gain of \$400 billion in the second quarter, a capital loss of \$1.1 trillion in the third quarter, and a gain of about \$600 billion in the fourth quarter.<sup>6</sup> Comparable flow-of-funds data do not appear to be available for Europe, but during 2001, EMU equity market capitalization fell by 14.2 percent, equivalent to €718 billion (\$640 billion). By contrast, U.S. equity market capitalization fell by 8.4 percent.<sup>7</sup>

The aforementioned financial adjustments are a manifestation of structural changes that are likely to be particularly relevant for gauging risks to financial market stability going forward: the significantly greater exposure of households and corporate balance sheets and net worth to financial asset prices and markets. In the past, commercial banks acted as the main shock absorber for many of their corporate clients, as they continued to provide financing through good and bad economic conditions, up to a point. Traded instruments now account for about one-third of U.S. household financial assets, compared with one-quarter about a decade ago (see Figure 3.5). Likewise, traded instruments now account for about 44 percent of euro-area nonfinancial sector assets, compared with 38 percent in 1997 (see Figure 3.3).<sup>8</sup> Companies have also increasingly relied on the buoyancy of their own share prices to acquire other companies, to raise funds through new stock issuance, or to guarantee loans to their own special purpose financing entities.

Financial institutions themselves also depend more on markets. Commercial and investment

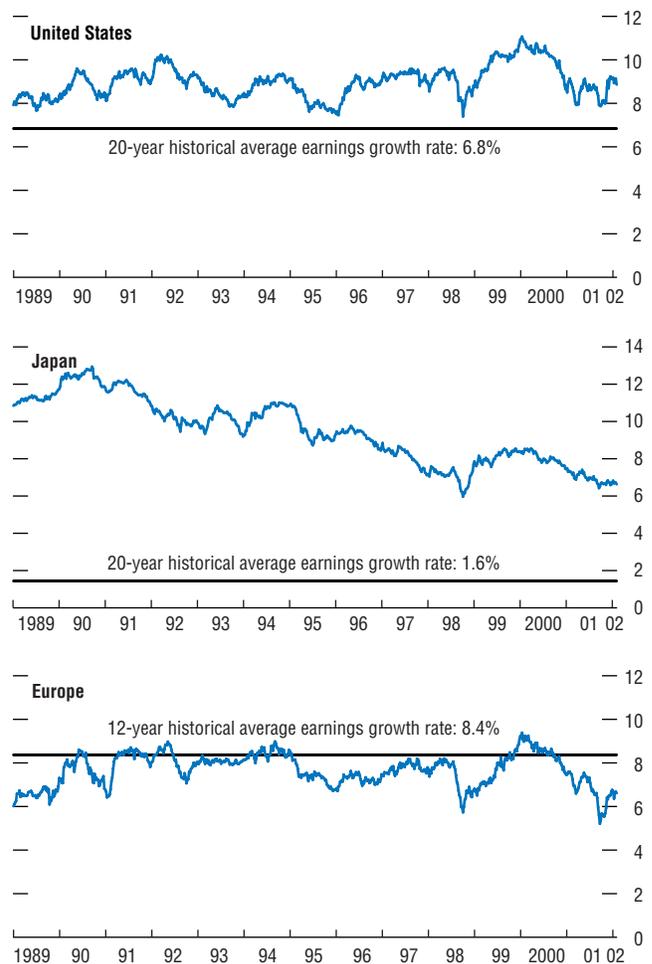
<sup>6</sup>Derived from Board of Governors of the Federal Reserve, Flow of Funds, Table R.100 and staff estimates.

<sup>7</sup>Figures based on Datastream indexes covering about only 85 percent of market capitalization.

<sup>8</sup>Includes general government, corporate, and household sectors. This development may partly reflect the rapid growth of euro area wholesale financial markets following the 1999 introduction of the euro. The introduction of notes and coins in 2002, while a key milestone from an economic perspective, was of less significance from a financial markets perspective.

**Figure 3.7. Implied Earnings Growth Rates<sup>1</sup>**

(In percent; weekly data)



Sources: Datastream; and IMF staff calculations.

<sup>1</sup>Expected earnings growth rates implied by levels of price-earnings ratios and long-term interest rates. Based on 8 percent equity premium.

banks actively use securities and derivatives markets to fund their activities, earn underwriting and trading income, and manage risks. Financial institutions are now more exposed to market, liquidity, and counterparty credit risks. This market re-orientation has been facilitated by the rapid growth of the global over-the-counter (OTC) derivatives markets (including credit derivatives, discussed in the next section), which between 1995 and 2001 virtually doubled in notional size to nearly \$100 trillion. As a result of the global slowdown and these structural factors, financial institutions have been affected through two channels. First, asset price adjustments have adversely affected balance sheets and asset quality. Second, the deteriorating general economic climate has put downward pressure on revenues and profitability as fee-based incomes have declined (for example, from brokerage commissions, initial public offerings, and mergers and acquisitions). In addition, domestically oriented financial institutions face intensified competition in markets from the large complex financial institutions (LCFIs) that dominate the mature and international capital markets and intermediate the bulk of international capital flows. LCFIs' international activities, particularly in the global interbank and OTC derivatives markets, have also strengthened the linkages among the major financial systems and financial centers. This may have increased the potential for spillovers across financial institutions and centers.

Based on the comparison with 1990–91, and even with the adverse effects of the considerable shocks of the September 11 attacks, Argentina's default, and the failure of Enron, the international financial system has shown remarkable resilience thus far, even if weak institutions have become more vulnerable. Moreover, in some ways the experience during the 1990s provides a basis for optimism that the international financial system will continue to cope. During that decade, markets proved resilient during a series of tests—the collapse of ERM; several episodes of bond market turbulence and equity price adjustments; crises in Mexico, Asia, and Russia; and the failures of Barings and Long-Term Capital

Management (LTCM). In each case, despite considerable market volatility and substantial losses experienced by individual institutions, the systemic economic and financial costs were well-contained. Of course, all of this occurred against the background of the longest U.S. economic expansion on record. It remains to be seen how long the system can remain resilient during a period of slower global growth.

In considering the risks going forward, two observations are worth re-emphasizing. First, the systemically important European and U.S. banks still seem to be well capitalized, and probably could withstand a further deterioration in financial conditions and asset quality without posing a substantial risk of instability: however, there exists heightened stress for weak institutions (although none of the weaker U.S. or European institutions may be systemically important). Second, at the same time, the increased reliance on market finance intensifies the effects of asset market adjustments on corporate and household balance sheets, with the potential for feedback onto economic activity and then onto financial market conditions.

### What Are the Implications for Financial Market Stability Going Forward?

Against this background, and in light of the financial imbalances that accumulated in major countries during the 1990s, the key question surrounding the implications for financial market stability going forward is *how well will financial markets cope with pressure on corporate profits and further credit deterioration, especially if the global recovery is subdued?* The answer to this question depends on how closely the economic outturn conforms with market expectations. Two scenarios can be identified that illustrate this.

Under a baseline scenario, the U.S. and global economies would begin to recover in early 2002. Since markets broadly reflect an expectation that this will take place, no widespread adjustment in asset prices or flows would be likely to occur. Some adjustments might be associated with unexpected developments in some sectors

or regions—such as new evidence of fragility in the high-tech sector, or signs of difficulties in emerging market countries that have so far avoided financial contagion. This could cause investors to rebalance portfolios toward those sectors or countries that would then be perceived as offering better risk-adjusted returns than before. In addition, according to some estimates, present U.S. equity valuations seem to imply higher levels of year-end corporate profits than consensus estimates now suggest. This suggests that asset prices could weaken even if the recovery matches the baseline forecasts for economic and profit growth. Nevertheless, as long as the global recovery unfolds as expected, any increased credit and market risks would probably be modest and could likely be readily absorbed by most investors and financial institutions. Therefore this scenario would be very unlikely to cause major problems in financial markets. Even in this benign scenario, however, the situation in Japan could worsen considerably—for example, if progress in implementing corporate and financial sector reforms is seen as faltering, if ongoing asset-price deflation continues to impair bank and corporate balance sheets, or if banking system strains reach critical proportions.<sup>9</sup>

Under an alternative scenario, the recovery would be subdued compared with market expectations. In this case, a slower pace of corporate earnings growth could lead to broad-based corrections in global equity markets. This may be particularly likely to occur in the United States, where price/earnings ratios reflect an optimistic outlook for corporate earnings growth, notwithstanding an unusually large cyclical decline in corporate profits as a share of GDP. In addition, reduced corporate earnings growth, along with rising corporate default rates (particularly among more highly leveraged sectors and companies) could cause credit spreads to increase and tighten conditions in domestic and international loan and bond markets as financial inter-

mediaries and investors sought to limit their exposures. Under this scenario, more market-risk-sensitive investors would probably rebalance their portfolios toward less cyclically vulnerable sectors, waiting for signs that the recovery had materialized in earnest before taking on significant exposure to cyclically sensitive risky assets. The credit market adjustment could also entail a higher interest burden for households and corporations that have relied heavily on floating-rate or short-term financing, particularly if risk premia in credit markets rise sharply. Along with the negative household wealth effects of asset price deflation, reductions in investment and consumption expenditure would work to constrain economic growth.

This scenario could have significant adverse effects on Japan and on emerging market borrowers. In particular, reduced external demand stemming from a global slowdown would put downward pressure on Japan's economic growth. This in turn could give rise to an increase in bankruptcies and add to asset-price deflation, and thereby heighten the stresses on Japan's already weakened financial system. Slower global growth, along with increased investor risk aversion, could also be reflected in tighter terms of access to international capital markets for emerging market borrowers (see Chapter II). This could pose challenges to countries that have relied heavily on international markets to meet their financing requirements.

In this kind of adjustment it is not possible to know how markets would behave. But in previous periods of adjustments in the 1990s, market intermediaries and participants have temporarily and selectively withdrawn from some types of risk taking in capital markets to protect their capital and assets. As in the past, risk management systems, mark-to-market accounting losses on securities holdings, and the increased risk of further losses could lead market makers to reduce their market exposures in particular mar-

<sup>9</sup>Another risk in this benign scenario is that shocks could affect the pattern of international capital flows and national and international financial conditions. Future reports will devote further analysis to this issue.

ket segments. Financial institution income and asset quality could also be adversely affected by reduced earnings (for some institutions, losses) from capital markets activities, and balance-sheet and off-balance sheet exposures. Meanwhile, counterparty credit risk exposures to institutions participating in derivatives markets would increase as well. If (as occurred in 1998 during the LTCM crisis) there were fears of further credit events, and in particular involving the soundness of some financial institutions, the prospect that OTC derivatives hedges might be unwound could lead to a rebalancing of portfolios. The experience with such adjustments in the 1990s, and the relative resilience of the international financial system at that time, is cause for optimism that adjustments would be manageable and contained. This is particularly so because there are likely to be countervailing forces working in the direction of maintaining financial stability, as, for example, through the markets' self-correcting mechanisms and as a result of possible further monetary policy adjustments. However, in the scenarios just described, all of these adjustments would occur against the background of a global slowdown and already somewhat weakened financial conditions, and it cannot be excluded that several of the weakened financial institutions might come under additional stress.

### How Effectively Is the Market for Credit Risk Transfer Vehicles Functioning?

The market for instruments that transfer credit risk from one investor to another—credit risk transfer vehicles such as credit default swaps and collateralized debt obligations—is now undergoing the first major test in the form of a U.S. recession and global economic slowdown. This test comes after a relatively short period of very rapid growth. Between 1997 and 2001, the notional amount of outstandings increased by about ninefold to an estimated \$1.6 trillion. A

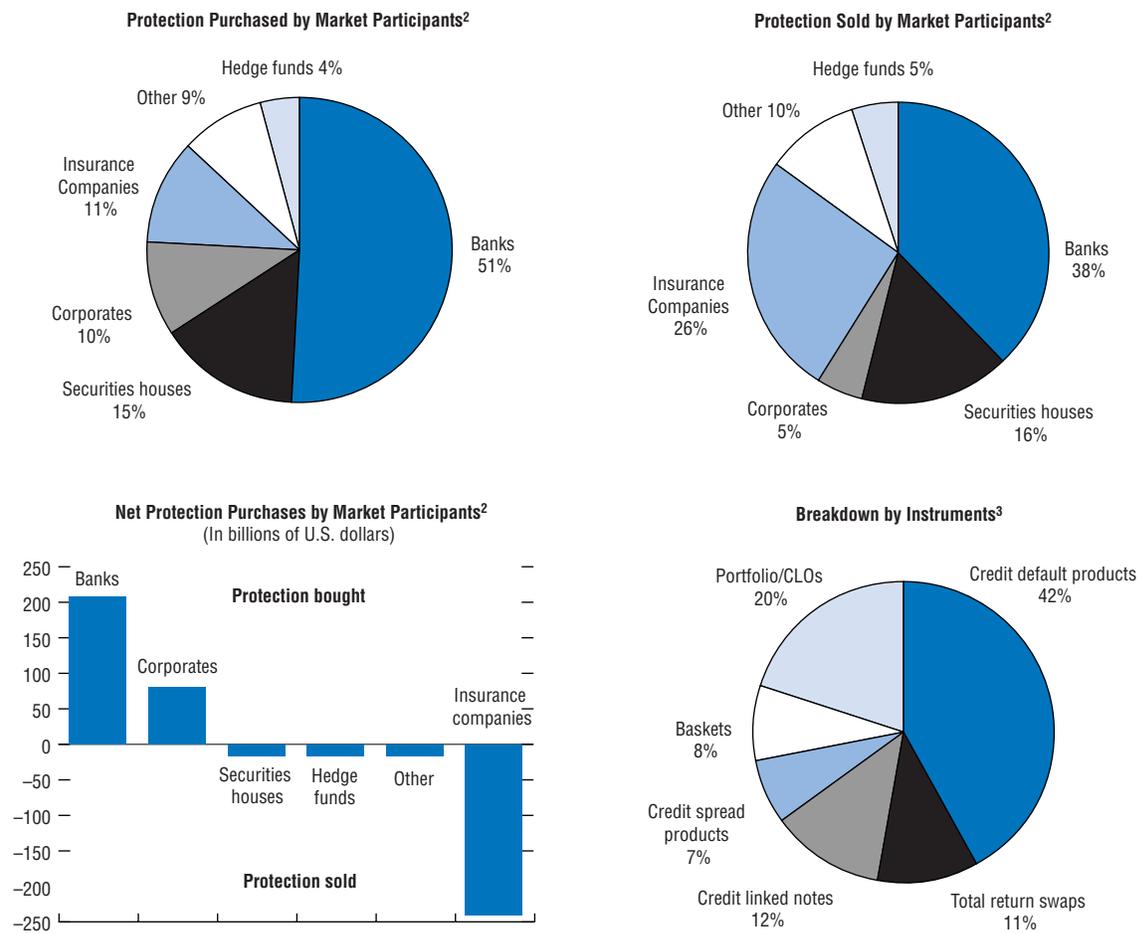
variety of market participants—including commercial and investment banks, and institutional investors (such as mutual funds, insurance companies, pension funds, and hedge funds)—are now using the market to hedge or take on credit risk (Figures 3.8 and 3.9).

Measured in terms of notional principal—the reference amount on contracts—the credit risk transfer market is still small compared with the entire OTC derivatives market, which amounts to about \$100 trillion. But this comparison significantly understates the amount at risk in credit risk transfer contracts compared with most OTC derivatives contracts. For a standardized contract such as an interest rate swap, credit exposure is typically equivalent to about 3 to 5 percent of the notional principal. By contrast, for a credit derivative, credit exposure could be up to 100 percent of the notional amount. This is because some credit derivatives involve the exchange of a cashflow equivalent to the principal amount of the underlying credit instrument (in some cases, less the market or recovery value of the underlying instrument) when they are exercised, whereas principal amounts are not exchanged in standardized interest rate swaps. Moreover, credit risk transfers will probably account for an increasing share of OTC derivatives markets owing to their rapid growth—which some market participants predict could range around 40 to 50 percent per year over coming years.<sup>10</sup>

Particularly as the markets mature and grow over time, credit risk transfers have the potential to enhance the efficiency and stability of credit markets overall and improve the allocation of capital. By separating credit origination from credit risk bearing, these instruments can make credit markets more efficient. They can also help to reduce the overall concentration of credit risk in financial systems by making it easier for nonbank institutions to take on the credit risks that banks have traditionally held. In addition, credit risk transfers allow banks and other

<sup>10</sup>Deutsche Bank, "Credit Derivatives Outlook," January 8, 2002, p. 2.

**Figure 3.8. Global Credit Derivatives Market Size and Structure<sup>1</sup>**



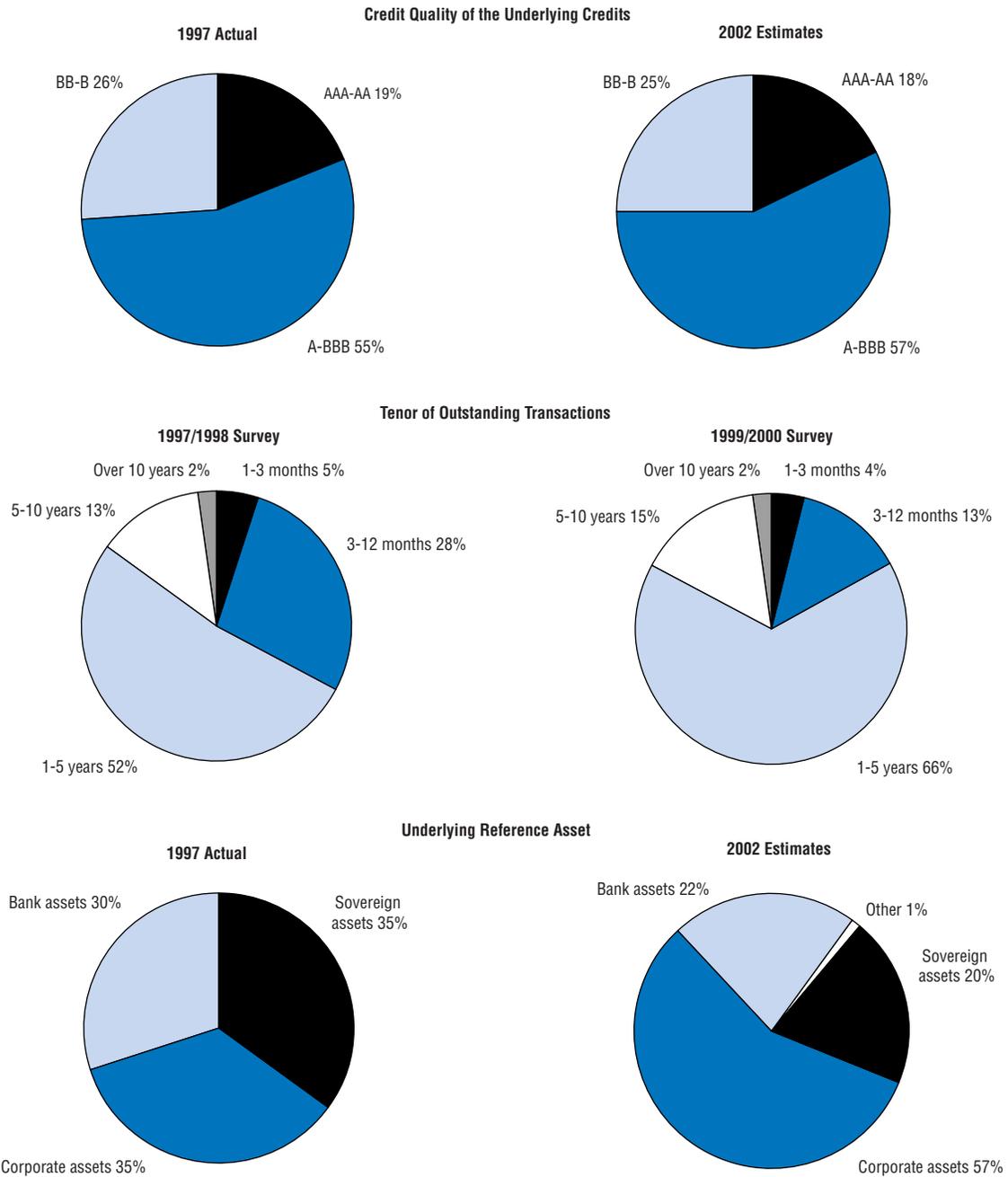
Sources: British Bankers' Association, *Credit Derivatives Survey 1999/2000*, and Bank of England (2001).

<sup>1</sup>Based on 2001 estimated market size and 2002 estimated shares of sales/purchases of protection.

<sup>2</sup>Other includes government/export credit agencies, mutual funds, and pension funds.

<sup>3</sup>CLO refers to collateralized loan obligations.

Figure 3.9. Key Characteristics of Credit Derivatives Markets



Source: British Bankers' Association, *Credit Derivatives Survey 1999/2000*.

financial institutions to diversify their credit exposures across markets and sectors. They also facilitate the trading of credit risk, which can help financial and nonfinancial institutions to manage their credit exposures more flexibly. Finally, liquid credit risk transfer markets can augment price discovery and provide price information that usefully supplements the information available from more traditional credit markets.

At the same time *these instruments and markets are currently being driven by regulatory arbitrage, involve nontraditional players, and are adding to the complexity of financial transactions and markets.* In this way—and as will be explained in more detail below—they have posed new challenges or intensified existing ones. First, they are reducing transparency about the institutional distribution of credit risk and its concentration. Second, while they are dispersing credit risk to a broader set of market participants, they may be creating or magnifying channels through which the distress associated with credit events would spread across institutions and markets (including through the web of rapidly shifting counterparty exposures). Third, these instruments seem to have created demand for credit risk by a much larger and different set of market participants, generally less, or even, not regulated as well as banks, and not necessarily having the experience required for properly pricing or managing these risks. Finally, by their very nature, credit risk transfer mechanisms are by and large leveraged instruments, and they can add to the total amount of credit that is internally created within the financial system. This increases the potential for mispricing and misallocation of capital. For these reasons, the market's ability to efficiently and effectively transfer credit risk potentially has implications for financial efficiency, if not financial stability.<sup>11</sup> As Federal Reserve chairman Alan Greenspan recently noted, “derivatives have provided greater flexibility to our financial system.

But their very complexity could leave counterparties vulnerable to significant risk that they do not currently recognize, and hence, these instruments potentially expose the overall system if mistakes are large. In that regard, the market's reaction to the revelations about Enron provides encouragement that the force of market discipline can be counted on over time to foster much greater transparency and increased clarity and completeness in the accounting treatment of derivatives.”<sup>12</sup>

### Market Performance During the Slowdown

Since the beginning of the slowdown in global growth, financial strains on corporate and sovereign entities have given rise to a number of credit events, some of which in turn have triggered payments on—or legal disputes about—credit risk transfer instruments. As noted earlier, in 2001, amid an unusually large cyclical erosion in U.S. corporate profits relative to GDP, corporate defaults rose to annual record levels, with 211 issuers defaulting on \$115 billion in debt. In January 2002, corporate defaults reached new monthly highs, with 41 issuers defaulting on \$31 billion in debt. Defaults also have been more clustered than expected, and recovery rates have been lower than expected. Accordingly, market participants have reportedly begun to improve discipline on issuers by adjusting the pricing and collateral terms of contracts and scrutinizing structured financial instruments (involving underlying and derivative instruments) more closely. Some investors and credit-protection sellers have sustained sharp losses. For example, American Express lost \$370 million in June 2001 on a \$1.4 billion collateralized debt obligation (CDO) portfolio, and several internationally active financial institutions have already experienced losses on credit enhancement transactions with Enron now that it is in the midst of bank-

<sup>11</sup>For an extensive discussion of the risks associated with OTC derivatives, see Schinasi and others (2000).

<sup>12</sup>Testimony of Chairman Alan Greenspan (Federal Reserve Board's semiannual monetary policy report to the Congress) before the U.S. House of Representatives Committee on Financial Services, February 27, 2002.

ruptcy proceedings, the full extent of which will not be known with certainty until the bankruptcy proceedings and related lawsuits are resolved. In addition, there is some uncertainty about the performance of some of the credit risk transfers used to hedge credit exposures to Enron.<sup>13</sup> According to credit analysts and market participants, except for Enron, no private counterparties to credit risk transfer vehicles have yet defaulted. Accordingly, they see the markets as having worked reasonably effectively to insure credit risk so far. Dealers and credit rating agencies see activity in credit risk transfer vehicles, which in the CDO market was reportedly fairly well-sustained through September 11, as reflecting continued investor and dealer appetite for credit risk.

As a result of these financial strains and credit events, and in particular recent private default events involving Railtrack and Enron, weaknesses in the legal and operational infrastructure of OTC derivatives markets have resurfaced—as they did during the LTCM crisis—and in particular have raised concerns about the performance and enforceability of some credit risk transfers.<sup>14</sup> There are three recent examples of this. First, hedge funds had arranged credit default swaps<sup>15</sup> to hedge credit risk in convertible bonds issued by Railtrack, which was placed in administration in October. Afterwards, uncertainty prevailed

about whether convertible bonds could be delivered for the swaps. Some of this uncertainty was addressed in November when the International Swaps and Derivatives Association (ISDA) issued supplementary documentation.<sup>16</sup>

Second, in December 2001, Enron's failure and its involvement in credit and other OTC derivatives markets highlighted longstanding uncertainties about the legal effectiveness in bankruptcy of "closeout netting" provisions in OTC derivatives documentation (Box 3.1).<sup>17</sup> Without closeout netting, OTC derivatives holders could be exposed to a defaulting counterpart on a gross, rather than net, basis (U.S. banks' gross OTC derivatives exposures are about four times larger than their net exposures). U.S. bankruptcy legislation that would resolve this uncertainty for U.S. contracts is still under review in Congress, as it has been since the collapse of LTCM in the autumn of 1998.

Third, in early 2002, JP Morgan Chase sued insurance companies that failed to pay off on \$965 million worth of surety bonds issued to JP Morgan as insurance against the failure of Enron to make good on forward contracts involving the delivery of natural gas and oil. Surety bonds typically are used as a general form of protection against nonperformance of delivery of goods.<sup>18</sup> The insurance companies are alleging that JP Morgan had no intention of taking

<sup>13</sup>See Financial Times (2002a, 2002b).

<sup>14</sup>Earlier watershed credit events included the Conesco restructuring (September 2000), which raised issues about whether restructuring should be treated as a credit event, and the National Power demerger (November 2000), which raised issues about the treatment of credit derivatives involving obligations that are split between successor companies. These contract design issues were subsequently addressed in supplements and user guides issued by the International Swaps and Derivatives Association.

For discussion of legal risks in OTC derivatives markets, including credit derivatives, see Box 3.6 in Schinasi and others (2000).

<sup>15</sup>These contracts involve the payment of periodic premiums from a "protection buyer" to a "protection seller." In the event that a predefined "credit event" such as default occurs, the protection seller makes a payment related to the market value of an underlying reference instrument such as a bond. For example, the protection seller might either buy the reference instrument at par value from the protection buyer, or make a payment that is equivalent to the difference between par and market value. For more technical details on these and other instruments see *Handbook of Credit Derivatives* (1999).

<sup>16</sup>ISDA develops standards and serves as a forum for the discussion of legal and documentation issues surrounding OTC derivatives contracts.

<sup>17</sup>Closeout netting—the settlement of net outstanding obligations by a single payment in the event of default—mitigates the risk that a bankrupt counterparty will 'cherry pick' its obligations by attempting to enforce those that have positive value to it while repudiating the others. See Schinasi and others (2000).

<sup>18</sup>A surety bond is a bond issued by one party, the surety, guaranteeing that he will perform certain acts promised by another or pay a stipulated sum, up to the bond limit, in lieu of performance should the principal fail to perform.

### Box 3.1. Financial Implications of Enron's Bankruptcy

Enron has come to symbolize the use of aggressive accounting techniques by major companies to mask excessive leverage and weak earnings. The company's collapse—the largest U.S. Chapter 11 bankruptcy in history—also caused significant volatility in financial markets and will no doubt lead to significant losses for financial institutions and institutional and retail investors. So far, these effects have not been seen as having systemic financial consequences, because exposures to Enron are generally well diversified across institutions and markets. Remaining uncertainties include: the likelihood that hidden losses will be uncovered as Enron's highly complex financial operations are unwound; the magnitude of bank exposures to other energy companies that are also facing difficulties because of Enron's collapse; the size and structure of Enron's derivatives books; and the extent of insurance company exposure.

As described in the text, Enron's failure highlighted uncertainties about the effective functioning of credit-risk transfer vehicles. It also underscored three broader capital-markets issues.

*Inadequate oversight of financial activities of non-financial corporations.* Enron was the main dealer, market-maker, and liquidity provider in major segments of the OTC energy derivatives markets, and was also active in other derivatives markets segments (at end-September 2001, its overall derivatives trading liabilities stood at about \$19 billion). Despite its size, complexity (including many off-balance-sheet special purpose vehicles), and central role in the energy derivatives markets, its OTC derivatives activities were essentially unregulated (like those of many other large market participants that trade on a principal-to-principal basis).<sup>1</sup> In particular, it was not required to disclose information about its risks to counterparties; disclose information

about market prices or conditions, even in markets that it dominated; or set aside prudential capital against trading risks. It is possible, but not yet clear that these gaps contributed to its demise and the associated financial market implications. Because its trading unit's capital was not segregated from the parent company's capital, a loss of confidence in the parent company's soundness led its banks to withdraw credit lines, which in turn contributed to a collapse in its trading operation. Some observers have since called for revisions to the 2000 Commodity Futures Modernization Act that exempted energy derivatives activities from key regulatory provisions, and U.S. Congressional hearings have since clarified that certain energy derivatives contracts are not covered by key regulatory provisions. Nevertheless, even if these exemptions had not been made, Enron's activities in, for example, credit and other financial derivatives markets would still have been essentially unregulated.

*Ineffective private market discipline, disclosure, corporate governance and auditing.* Enron's financial difficulties and vulnerabilities, including those associated with its extensive off-balance-sheet transactions, seemed to have gone undetected by analysts as well as its shareholders and creditors until it was on the brink of bankruptcy. In part this may have reflected inadequate accounting rules and standards as well as errors by its auditors, which (among other oversights) did not uncover related-party transactions or require Enron to properly consolidate its many and complex off-balance-sheet SPVs in its financial statements. In October 2001, the correction of this and other errors resulted in a restatement of income since 1997 by \$600 million and a writedown of shareholder equity by \$1.2 billion. Questions also arose about the auditor's possible conflict of interest owing to its parent company's extensive consulting business with Enron (in 2000 Enron paid it \$25 million in auditing fees and \$27 million in consulting fees). Along with allegations that the auditor destroyed documents relevant to a Securities and Exchange Commission inquiry,

<sup>1</sup>Testimony of Vincent Viola, Chairman, New York Mercantile Exchange, before the Senate Energy and Natural Resources Committee, January 29, 2002. Energy derivatives are subject to the anti-fraud and anti-manipulation provisions of the Commodity Exchange Act, however.

**Box 3.1 (concluded)**

these revelations led to widespread calls for a closer examination of auditing standards and practices.

*Misallocation of retirement savings.* More than 10,000 of Enron's employees held most of their retirement savings in Enron stock, including Enron's contributions (entirely in company stock)—which the company prohibited them from selling until age 50. In addition, for three weeks in October, Enron required its employees to freeze their asset allocations as it switched plan administrators, during which time Enron stock fell by 35 percent. As a consequence of the

pension plan's poor diversification and inflexibility, during 2001 a large share of employee savings were wiped out as Enron's stock price plummeted from about \$90 to less than \$1.00. In the early part of 2002, the U.S. authorities formed a working group to consider potential reforms to the Employee Retirement Income Security Act (ERISA) rules that govern private pension investments, and the U.S. Congress held hearings to discuss (among other topics) how to address gaps in ERISA that permitted a high concentration of Enron stock in the company's pension fund.

physical delivery and instead used the transactions as a way of extending loans to Enron collateralized by the surety bonds. These examples together highlight, in actual practice, the opacity and legal uncertainties associated with credit risk transfers.

Argentina's default in December also constitutes a major test of the rapidly growing market for emerging market credit default swaps. There presently are no reliable estimates or surveys of the total outstanding amount of Argentine default protection. But market observers suggest that the total could be in the range of \$10 to \$15 billion in notional amount covering a large number of contracts. These contracts are now in the process of being settled.

In sum, some progress has been made in addressing operational "teething problems" in the nascent credit risk transfer markets, particularly for standardized "vanilla" instruments such as credit default swaps. At the same time, as evident from ongoing legal disputes, some operational issues highlighted by the downturn and deteriorating credit environment remain to be addressed. Moreover, there may be significant operational risks in the CDO market, which involves heterogeneous instruments and SPV structures that can be complex and relatively nontransparent to investors. In addition, the po-

tential for CDO investors to experience sudden and larger-than-anticipated losses (as in the case of American Express) raises a question about whether such vehicles pose reputational risks to banks. An originating bank might prefer to compensate its investors for losses or buy back the product, rather than risk damage to its reputation that could prevent it from selling such products in the future. If this occurred, the bank would wind up with a loss on the underlying credit exposure despite having bought credit protection in what seemingly had been an "arms length" transaction.

**Challenges Going Forward**

The development of markets for credit risk transfers is still in an early stage of the new product cycle typical of new markets. As noted above, in 2001 the market seemed to be able to cope with a series of credit events that emerged as the global economy slowed. Payments were by and large made by credit risk protection sellers to protection buyers, even though in some cases this occurred only after arbitration. At the same time, the global slowdown—along with rising corporate defaults—has revealed some challenges in using these instruments and in understanding their impact on financial stability.

First, credit derivatives can reduce the transparency about who owns credit risk. This occurs, in part, because the transfer of credit risk reduces the informational content of balance sheets without necessarily providing additional information about where the risk is transferred or even how it is priced. By reducing transparency about credit exposures, the growth in credit derivatives complicates the assessment of private credit and counterparty risk in individual institutions. It also makes it more difficult to assess the overall distribution of credit risk across institutions and markets, and the challenges that credit risk transfers might pose to liquidity conditions in related underlying and derivative markets (i.e., it poses liquidity risks) and more generally to financial market stability. The fact that there are now nontraditional entities that are trading in these markets—such as Enron, for example—that are not subject to the same disclosure rules and standards as regulated financial institutions further adds to the lack of transparency. Moreover, and as illustrated by the case of Enron, there are also gaps in accounting rules and standards, particularly regarding special purpose vehicles, as well as in auditing practices, that apparently are also contributing to a lack of transparency.

Second, regulatory arbitrage involving credit risk transfer vehicles is shifting credit risk exposures to outside the banking system. This is a concern because regulatory incentives appear to encourage banks to transfer credit risk to other institutions—such as hedge funds, pension funds and insurance companies—that are not prudentially regulated like banks, in particular as regards capital adequacy, and that have not traditionally had cultures or risk management systems that are as attuned to credit risk. Nevertheless, these nonbank financial institutions manage a large volume of assets distributed across global markets and are part of the global

network of counterparty risk exposures. Some believe they are the weak links in the chain of counterparty relationships. A string of unanticipated credit events that caused those market participants to experience much larger-than-expected losses could lead them to reduce their willingness to supply credit protection when banks need it most. It could also lead to a withdrawal of capital devoted to market making in credit risk transfer markets. These reactions, if they were sharp and sustained, could significantly impair liquidity and create volatility in the credit derivatives and related markets, similar to the way in which the threat of default by LTCM affected credit markets in 1998.

Third, because the use of credit risk transfer vehicles tends to increase the linkages between markets and institutions, these new instruments tend to increase the potential for spillovers across markets or to augment existing ones. For example, unanticipated shocks to an underlying bond or loan transaction for which there is an associated credit derivative would give rise to increased demand for credit hedges. During a period of turbulence in the underlying market, situations could arise in which there would be one-sided, illiquid, and volatile credit derivative markets, which through counterparty relationships could spill over into connected markets. Likewise, in a market where there are relatively few very large counterparties, a cluster of credit events could trigger payments on many contracts at once and put considerable liquidity demands on one or more of the relatively small number of major market makers.<sup>19</sup> If these market makers had to sell a wide range of liquid securities from their portfolios to cover payments, volatility could rise sharply in a variety of markets at once. In addition, as a number of the institutions that sell protection—particularly insurance companies—typically have access to bank credit lines, they might tap these lines to fund payments on

<sup>19</sup>Global data are not available, but in the United States, one bank holds 60 percent of the banking system's outstanding notional credit derivatives; two banks hold 75 percent. As noted elsewhere, banks are net buyers of credit protection; it is unclear whether holdings of net protection sellers are similarly concentrated.

credit risk transfer contracts, potentially putting pressure on bank liquidity. Finally, credit hedges could fail to perform as expected if a major protection seller came under financial stress and either contested the legality of the contract or was unable to pay. This could leave banks with unhedged credit positions, give rise to an increase in the demand for credit hedges and/or unloading of credit positions, and potentially lead to an increase in credit-market volatility.

These transmission mechanisms can be magnified by the leverage inherent in credit derivatives. As with other OTC derivatives, credit derivatives allow investors to take on exposure to an underlying credit instrument while committing much less funds than would be required to actually buy the instrument. In addition, a single underlying credit transaction can give rise to multiple gross credit derivative transactions as dealers hedge and lay exposures off on one another. The total gross credit exposures created through this process can in principle substantially exceed the exposure on the underlying instrument. For example, an initial \$1 billion credit transaction might give rise to 5 rounds of hedging as dealers pass the exposure around the market. Each transaction involves the creation of another \$1 billion in gross exposure to one counterparty; five such transactions therefore give rise to \$5 billion in gross credit exposure.

Fourth, because these are relatively new instruments and markets, and there is now easier investor access to credit risk markets, a significant amount of capital from nontraditional sources is flowing into credit risk transfers. Concerns have been raised that there is not yet a full understanding of the costs and benefits of these instruments. More generally, the tendency for credit derivative spreads to be volatile and even decline below the spreads on the underly-

ing bonds raises questions about whether participants in the credit derivative markets—especially those that have not traditionally managed credit risks—have yet learned how to price these contracts appropriately. In early 2001, a strong supply of credit protection—including from institutional investors and money managers—compared with demand for credit protection from banks apparently contributed to narrow and sometimes even negative spreads between the credit default swap premium and the credit spread on the underlying security (Figure 3.10).<sup>20</sup> Whether or not contracts are being properly priced is difficult to know, in part because the theory of credit derivative pricing is still developing. If in fact credit derivative prices “overshoot” and are excessively volatile relative to the price of the underlying credit, this would distort signals about credit risks. Accordingly, it would also raise questions about whether credit risk transfer vehicles improve or reduce the efficiency of credit allocation in markets.

Looking ahead, improvements to the infrastructure for, and transparency of, credit risk transfers could help them to develop more fully, help market participants to manage the risks, support market discipline, and make the markets more efficient. This occurred in the OTC swaps markets during the 1990s, and there is good reason to expect the credit derivative markets would mature through time as well. Infrastructure improvements in the future will no doubt include better documentation that further refines the definition of a credit event. Bankruptcy legislation that would establish the legal effectiveness of closeout netting and a convergence in bankruptcy laws about what constitutes a default would also encourage further maturation of the market. Better information about the size and structure of the market and

<sup>20</sup>The premium is the spread over the London Interbank Offered Rate (LIBOR) that is paid for credit protection. Although the analytical theory is still being developed, the difference between the premium on a credit derivative and the credit spread on the underlying instrument partly reflects differences in tax treatment, liquidity, and counterparty risks for a bond versus a credit default swap. These structural features might limit the extent to which market participants can arbitrage away the difference in spreads between the two markets. The sharp blowout in spreads during September probably reflects an increased demand for credit protection following the attacks.

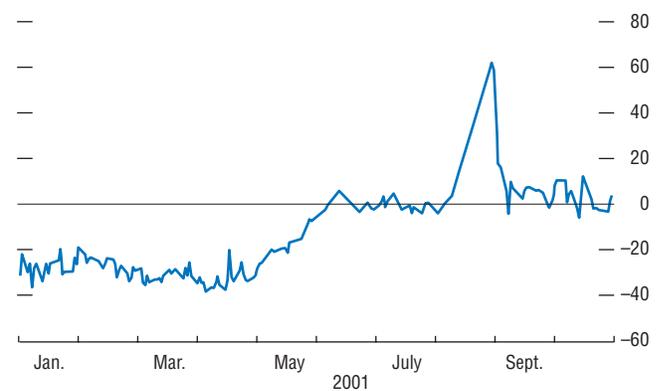
the exposures of bank and nonbank financial institutions active in the market would help market participants assess the attendant risks and gauge whether they are well-managed by the institutions involved in the markets. Accelerated progress on all these fronts would go a long way toward addressing the weaknesses highlighted above.

### Potential Implications of Increasing Retail Investor Involvement

Another issue that could become more important in the future is the now small, but increasing, exposure of retail investors to the risks associated with credit risk transfers. Hard data on retail participation and exposures are not available, but retail investors are seen by market participants as searching for higher-yielding alternatives to their traditional investment instruments such as stocks, government and corporate bonds, money-market mutual funds, and bank deposits in light of the low returns on such instruments in the recent period. Retail demand may also reflect the longer-term underlying trends of disintermediation and more direct retail investment in asset markets. In this environment, retail investors have increasingly invested and become exposed to the risks in a variety of structured products, including guaranteed funds—providing downside protection by hedging exposures in derivatives markets—and mutual funds that own CDOs.

At present, credit analysts see retail investors' relatively limited participation in credit risk transfer markets through three main channels: investments by "high net worth individuals," mutual funds, and hedge funds.<sup>21</sup> Although data are not available, in view of their recent proliferation, hedge funds are a principal channel for indirect retail participation in credit risk transfer markets. Hedge funds invest in CDOs and em-

**Figure 3.10. Spread Between Credit Derivatives Premium and Underlying Bond Spread<sup>1</sup>**  
(In basis points)



Sources: Deutsche Bank.

<sup>1</sup>Average for credit default swaps on four investment grade U.S. corporations.

<sup>21</sup>Retail participation takes place through mutual funds investing in CDOs rather than credit derivatives, as the latter trade only on OTC markets made up by financial-institution counterparties.

ploy credit default swaps to hedge the credit risk in convertible bond arbitrage strategies. Retail investments in these strategies have become more accessible as hedge funds have reduced minimum investment requirements and instituted less restrictive “lock up” rules that allow investors to withdraw more quickly. Hedge funds that meet enhanced disclosure and regulatory requirements are allowed to increase the number of investors (thereby reducing their minimum investments), and are more readily accessible to pension funds and other institutional investors. Moreover, minimum investment rules may be increasingly irrelevant, because one can invest any amount in recently created offshore-based funds, structured as “closed end” funds, which invest 100 percent of their assets in hedge funds (“funds of funds”).<sup>22</sup> It is estimated that about 440 funds of funds exist and account for about 20 to 25 percent of the hedge fund universe of \$500 billion in capital under management (UBS Warburg, 2001).

Even if direct involvement and exposure in credit risk transfer mechanisms are limited, retail investors can become exposed to credit risk in many less transparent ways. For example, shareholders of American Express stock were adversely affected when it became known that American Express had taken significant losses on their investments in CDOs, which involved credit risk transfer mechanisms. Markets adjusted to this new information, the company’s share price fell, and shareholders saw the value of their investment decline.

Likewise, many retail investors may hold mutual funds that invest in riskier credit instruments in order to enhance their yields. One illustration of this is the unexpected impact of the collapse of Enron on some Japanese money management funds (MMFs). These MMFs invested in Enron’s Euroyen bonds and marketed shares in their funds to Japanese retail investors as a high-yield alternative to bank deposits. The

collapse of Enron caused a sudden redemption on these funds, as investors withdrew ¥2 trillion (\$16 billion) from the MMFs. This was well in excess of the funds’ holdings of Enron Euroyen bonds (totaling ¥40.5 billion). The redemptions, among other things, prompted the Bank of Japan to expand its liquidity provision to offset the potential adverse impact on financial markets. This resulted in an increase of current account balances by ¥6 trillion (\$49 billion). This action followed the earlier expansion of liquidity provision in Japan of more than ¥8 trillion, as a result of the impact of liquidity effects in Japan following the events of September 11.

As a result of all these changes, the hedge fund industry, including the segment that is active in credit risk transfer markets, is widely considered to have been “democratized.” For instance, many of the new retail investors are not the traditional “high net worth individuals”—minimum investments in hedge funds in Europe, Japan, and the United States are now as low as €20,000 (or \$18,000). Reflecting this easier access, retail hedge fund investments surged from \$8 billion in 2000 to over \$22 billion in 2001 through September. The potential for retail participation will increase further as more hedge fund investment vehicles begin to be offered publicly.

At present, the potential for active retail participation in credit risk transfer markets seems to be mainly an investor protection issue. As noted above, even some sophisticated market participants have encountered challenges in investing in and understanding how best to use credit risk transfers. In this regard, there may be cause for concern about, first, the ability of retail investors to understand fully the risks in credit risk transfer vehicles and price them accordingly—particularly given the difficulties that some sophisticated institutional investors seem to have had with this—and, second, whether the disclosure and transparency standards that have been de-

<sup>22</sup>Onshore funds, however, may be subject to regulation. In the United States, retail investors in “funds of funds” receive the protection afforded an investor in any registered investment company. These include enhanced disclosure and prudential requirements placed on the fund that are designed to prevent self-dealing and favoring of affiliates.

veloped for other instruments, such as mutual funds, would need to be updated.

An additional complication is that the activities of intermediaries that offer products such as guaranteed funds might be altering the distribution of credit risks in the financial system. Internationally active financial institutions trade actively in global exchange-traded and OTC derivatives markets in order to hedge their exposures to the retail products they sell, in effect arbitraging between professional hedging markets and the retail markets. As this activity effectively transfers credit risk from the fund to its counterparties—which can include a wide range of financial institutions such as hedge funds and insurance companies—it both complicates an assessment of who bears the ultimate risks associated with the products and raises questions about whether the counterparties can manage these risks well.

If and as retail investor participation grows over time, the broader dispersion of credit risks across investors could improve the effectiveness of credit risk transfer markets in mitigating the financial effects of periods of economic stress. Nevertheless, the relatively limited sophistication of individual investors and questions about disclosure and transparency could have implications for financial efficiency and/or stability. For instance, herding or “bandwagon” effects could occur in credit risk transfer markets if retail investment decisions are driven primarily by investor sentiment rather than information about changing fundamentals. Similarly, if disclosure and transparency to retail investors about the risks in these vehicles are insufficient, this would increase the potential for investment mistakes to occur, as well as rapid unwinding of investment positions when these mistakes are discovered. Both of these effects would tend to increase volatility in credit prices and spreads, and might also adversely affect the efficient allocation of credit in the financial system.

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