SMM
A Freddie Mac Publication
SECONDARY MORTGAGE MARKETS

December 1999 • Vol. 16, No. 2

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Credit Derivatives

Hedging Closer to Happiness

by Frank Vetrano and Bill Lyons

MONEY CAN'T BUY HAPPINESS, BUT IT can buy peace of mind for risk managers operating in the capital markets.

Just ask Oriental Land Co., owner and operator of Tokyo Disneyland. The theme park is located, quite literally, on shaky ground running adjacent to the convergence of three massive tectonic plates in nearby Pacific waters. Worried about costly property damage from earthquakes, the Japanese conglomerate is among a growing number of companies busy devising novel capital-market transactions to **hedge** their more uncommon **business risks**. The **risk-transfer bonds** that result guard against a wide range of revenue-reducing perils that range from natural catastrophes to fluctuating used-car values and mortgage defaults.

In May, Oriental Land acquired peace of mind—$200-million worth—through a privately arranged risk transfer. If, within the next five years, an earthquake of stipulated magnitude, depth and location wreaks havoc on Tokyo's Disneyland, then Oriental Land's **bond** investors must forfeit their principal to pay for repairs. The $200-million payoff should give Oriental Land enough working capital to restore Cinderella's Castle, Chip 'n' Dale's Treehouse and the rest of this Magic Kingdom.

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Pairing Risk Shakers and Risk Takers

The flexibility offered by the risk-transfer bond structure is proving attractive to issuers and investors.

On the sell side, risk-conscious firms such as Oriental Land welcome the custom-designed securities as an alternative to increasing **capital reserves** or buying insurance to offset exposure to their unique business risks.

On the buy side, some investors pursue **credit-derivative** products to hedge market vulnerabilities of their own. For the most part, risk-transfer bonds move independently of interest-rate changes, so these investors find they can add stability to portfolios concentrated in fixed-income holdings.

Other investors are drawn to the juicy returns earned on risk-transfer bonds over the past two years. That advantage could prove short-lived, however. **Credit spreads** may narrow once the unknown asset class acquires a track record. A pattern of consistency could eliminate the uncertainty factor now driving a wider wedge between the prices at which **risk-transfer bonds** trade and those for better understood financial instruments.

For the time being, though, the appeal of earning a handsome spread above the benchmark **London InterBank Offer Rate (LIBOR)** apparently is enough to offset the experimental side of the Oriental Land bond product. No matter that this is the first time a non-insurance company has come to market with such an offering. No matter that investors are vying for the opportunity to bet against unpredictable Mother Nature in a seismically challenged country.

The world's deep-pocketed financial markets are challenging insurance-industry dominance as ultimate guarantor of business risk.

The enthusiasm exhibited by the bond community for Oriental Land's risk-transfer offering suggests that the world's deep-pocketed financial markets present a challenge to the dominance of the insurance and reinsurance industries as the ultimate guarantors of business risk. Fixed-income investors are lining up for the opportunity to wager on one-of-a-kind business risks.

Thanks to a run of good fortune, investors to date have won most of the risk-transfer gambles, aided by a confluence of negligible earthquake activity along the fault lines where investors have placed their bets, milder-than-expected hurricane weather, rising house-price appreciation and a prosperous economy. Turbulence in international financial markets last fall generated some fleeting investor squeamishness, but nothing more. Of course, like any high-stakes game, there are no guarantees. Why else would issuers pay generous risk premiums to investors to assume the financial burden when disaster strikes?

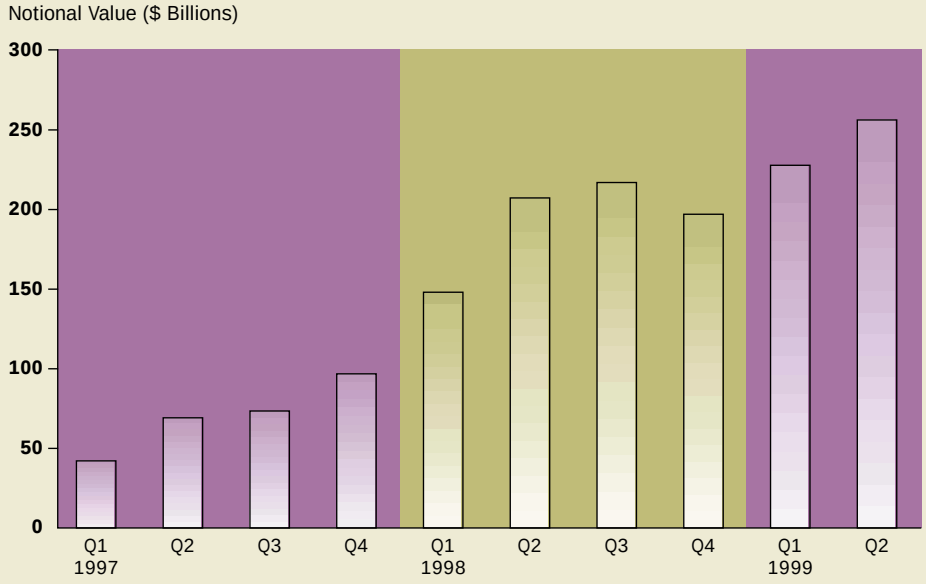
Pressing Derivative Format Into Generic Service

A security can be classified as a derivative when its value is linked to—or derived from—other events such as interest-rate movements, natural disasters, mortgage defaults, bankruptcies, unforeseen payoffs or future cash flows. When the economics underlying a derivative fail to perform as expected, the financial agreement ensures that someone other than the issuer must absorb the resulting financial losses.

Think of an investment position as a basket of risks that might contain, for example, **interest-rate risk** and **credit risk**. The ability to separate various risk characteristics and sell each to the highest bidder improves the value of the overall **bid price** and, eventually, results in a more efficient market.

Similarly, the ability to trade individual risks provides a viable alternative to the sale or purchase of whole assets when a single risk factor can change the value of an entire portfolio. Quite often, the

EXHIBIT 1: Quarterly Credit-Derivative Volume



NOTE: Volume figures reflect credit-derivative products issued through U.S. and foreign branches of federally insured commercial banks. See glossary for definition of notional value.
SOURCE: Office of the Comptroller of the Currency

The use of credit derivatives among federally insured banks operating in the United States and abroad has surged dramatically, more than doubling in a year to $770 billion in 1998. Annual volume is headed towards $1 trillion in 1999.

outright sale of assets is impractical or impossible due to large transaction costs or market illiquidity.

The diversification principal helps explain why the banking industry, for one, has found the credit-derivative instrument so useful, especially as customer bases merge amid ongoing bank consolidations. Fewer hands now hold larger, more powerful positions that come with commensurately riskier profiles.

Although doing business with just a handful of large accounts can lead to unacceptable concentrations of risk, few banks are eager to turn away business, particularly from an important customer. The presence of an efficient credit-derivatives market, however, allows companies to diversify risk positions discreetly by separating ownership of the credit risk from ownership of the underlying assets. A pair of banks, for example, can privately execute a credit-derivative deal whereby each assumes one-half the risk of the other without alerting either institution's customer base. Thus, banks can reduce their exposure to credit risk without fear of damaging relationships with account holders.

Generic Demand Alive and Kicking

Credit risk accounts for as much as 90 percent of total risks for commercial banks, which are among the most active users of a generic form of credit derivatives that hedges against loan-default risk. Since the Office of the Comptroller of the Currency began keeping track of these transactions in 1997, quarterly credit-derivative usage among federally insured domestic banks has doubled *(Exhibit 1)*. Moreover, volume issuance is expected to increase to $1 trillion for all of 1999, based on historically upward-trending usage numbers. Even the $1-trillion figure understates the instrument's popularity because it does not include activity by nonbanking institutions or banks headquartered outside the United States.

The growth in the use of credit derivatives is striking, yet it remains dwarfed by the market's

EXHIBIT 2: Selected Risk-Transfer Issues

Insured Entity	Date	Size	Risk Hedged
Oriental Land	May 1999	$200 M	Earthquake Damage
James Brown	May 1999	$100 M	Royalty Value
Toyota	July 1998	$566 M	Lease Residuals
Freddie Mac	May 1998	$243 M	Mortgage Default
USAA	June 1997	$200 M	Hurricane Damage

Source: Goldman Sachs & Co., Lehman Brothers, Freddie Mac

acceptance of interest-rate derivatives, a related type of financial instrument that predates the credit derivative. As of year-end 1998, the amount of interest-rate derivatives outstanding totaled $8.8 trillion. The same dynamics that propelled the interest-rate-risk mitigation product to prominence now appear ready to create a lasting demand for these newer hedging instruments. That, in turn, suggests a potential for growth in credit-derivative usage that is phenomenally high.

CAT Bonds Inspire Hedges For Unique Business Risks

The ultimate payoff on derivative transactions is associated with a distinct event, making interest-rate risk and credit risk well suited to the instrument. The International Swaps and Derivatives Association (ISDA) has developed standardized agreements that can be used to spell out those distinct events. An ISDA form designed to document a credit-derivative agreement, for instance, allows the parties to identify their index of choice, but it must be one that generally is recognized and unbiased for tax purposes. From there, the parties can move on to defining a trigger event—which might include the breach of a dollar limit on bond-yield increases, default of a loan, bankruptcy of a corporation or downgrading of a company's credit rating.

Although interest-rate risk and certain types of credit risk constitute the major uncertainties confronting banks and financial institutions, they are but a subset of the total universe of business risk. For that matter, many firms face other risks that are not as yet easily adaptable to a standardized derivative format.

The difficulty of securitizing unique business risks has not stopped the capital markets from making progress, however. Over the past two years, the capital markets have hosted a proliferation of novel bond transactions, some of which are highlighted in *Exhibit 2*.

Efforts to chronicle the development of a credit-derivative market for unique business risks are hampered by the fact that the largest deals take place privately. Goldman, Sachs & Co., which has brokered many of these deals, credits the capital markets with spawning at least 37 risk-securitization transactions involving $4.4 billion since late 1996.

Catastrophic risk-transfer bonds—CAT bonds in the colloquial—probably embody the closest thing to emerge as a generic structure for unique risks. For technical reasons, most CAT transactions take the form of insurance contracts, not derivative agreements. They nonetheless function similarly.

The earthquake self-insurance manufactured for Oriental Land is one example of a CAT bond. Another is the series of hurricane bonds created for United Services Automobile Association (USAA). Much of the insurance company's clientele lives in Texas and Florida, so USAA wanted a hedge against the possibility of back-breaking property claims posed by the hurricane-prone locations.

Disaster Averted, For Now

When the threat of Hurricane Floyd loomed largest earlier this year, USAA looked as though it might become the first company to see a CAT-bond payoff. The bondholders, though, escaped with principal intact when the hurricane inflicted nowhere near the $15 billion in property losses initially anticipated. Actual damages failed to pass the $1.5-billion threshold necessary to endanger the investors' $200 million at risk. Consequently, the chances have improved that the one-year bond will reach maturity, come May 31, 2000, without encountering a

catastrophic hurricane in the 3-, 4- or 5-strength category. Such a turn of events will leave investors happily banking quarterly coupon payments earning an enviable 3.66 percentage points above LIBOR.

The CAT-bond market paved the way for the creative transfer of other singularly distinctive business risks. Take the case of future song royalties due aging rock stars. The collaboration between musicians and Wall Street began in 1997 with British rock artist David Bowie's celebrated deal that gave him $55 million up front. For this, investors will get future royalty income from 25 record albums and songs recorded prior to 1993 (see "You Have Now Entered the Bowie Bond Era," *SMM*, July 1997).

Investors Feel Good, So Good, About Odds on Odd Risks

Wall Street struck again earlier this year when it packaged, marketed and sold the rights to James Brown's future cash flows. For his trouble, the Godfather of Soul pocketed an immediate $100 million against the chance that no one will want to hear his songs in the future. The bond payments, likewise, are repayable out of anticipated song royalties.

The prospective price of used cars also has presented fixed-income investors with another unprecedented opportunity. To get in on that action, investors bought into a Toyota Motor Corp. bond issue built around the expected salvage value of leased 1998 automobiles. While the car company did not want to get caught holding 260,000 Toyotas if the used-car market softened, plenty of sophisticated investors were willing to roll the dice for yields as high as 3.25 percentage points over LIBOR. Yet Toyota is not obligated to pay any interest—or even pay back the principal—if the residual value of the leased cars sinks too low.

The catastrophe-bond market paved the way for the creative transfer of singularly distinctive business risks.

Seeking Hedging Parity

The marketplace slowly is inventing the first risk-transfer tools to specifically manage the default risk connected with residential mortgages. The pace of innovation certainly pales next to the frenzy that produced **options**, **futures**, **caps** and **swaptions** capable of neutralizing interest-rate swings to which mortgages are prone (see "Derivatives: Powerful Tools in a Skilled Craftsperson's Hands," *SMM*, December 1996).

Until the 1970s, a fairly rudimentary approach prevailed in the management of interest-rate risk and default risk intrinsic to **conventional home mortgages**. Lenders simply retained ownership of the loans and all associated risks in their own portfolios, or they sold the loans as whole units and, by extension, all the risks. In 1971, Freddie Mac began issuing securities that carried only the interest-rate risk inherent in the **conforming mortgages** that formed the pools.

By guaranteeing the underlying mortgages against default, Freddie Mac provides several benefits to the market. Lenders eliminated much of the credit risk carried on their books by selling off conforming loans in portfolio. Investors in mortgage assets can escape from underwriting the loans, relying instead on Freddie Mac's **guarantee**. The market is able to generate better collective bid prices for mortgage products; institutional investors, it turns out, will pay more for the right to strategically invest in interest-rate risk alone. Along the way, increasingly sophisticated mortgage investors have acquired their own interest-rate-risk hedging tools on par with those used to manage other fixed-income instruments.

The acceptance of risk-transferring **mortgage-backed securities (MBS)** in the financial markets has benefited mortgage borrowers, too, in the form of lower conforming mortgage costs. Mortgage interest rates at the retail level have fallen as the price gap between mortgage securities and Treasury notes has narrowed. At present, the resulting interest-rate relief is saving consumers an estimated $12 billion annually, according to Freddie Mac calculations.

Dishing Up a Senior-Sub To Go

Imagine this. A hungry fixed-income **bond** investor visiting a fast-service mortgage-securities issuer places an order: "One **senior-sub** to go. Make that a low-risk, AAA credit rating, but hold the **GSE** guarantee. Not too spicy—I don't want to bite into any extra mortgage-default risk."

Sounds like a tall order, but the generic senior-subordinate sandwich has appeared on the capital-markets menu for 10 years. The bond structure evolved to insulate securities backed by **nonconforming mortgages** from **credit risk**. A senior sub delivers investment-quality bonds that respond to changing interest rates while remaining seemingly immune to **default**. To date, no senior-sub debtor has failed to pay interest when due or redeem investor principal at maturity.

To earn an AAA-credit rating, a **private-label security** issuer must match the investor protection prescribed by a **credit-rating agency**. To do so, a bond issue is sliced into several separately-rated classes, or **tranches**. First, the junior piece—followed by the **mezzanine** piece—absorbs any mortgage default losses. These layers protect the higest-rated of the tranches, the senior class, from losses up to the combined principal size of the bond segments.

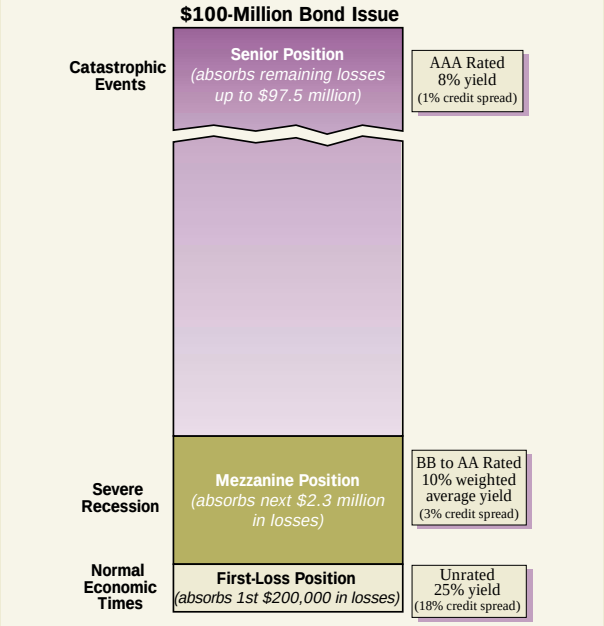
Stacking Up the Slices

Here's how a simple senior-sub deal might work: Suppose an originator wants to sell $100 million in high-quality loans in denominations larger than those guaranteed by Freddie Mac or Fannie Mae. The would-be issuer submits the mortgage pool to a rating agency for evaluation. To start with, the rater looks at the seller's underwriting guidelines and the underlying loan quality and performance.

In this hypothetical example, the rater concludes that less than one-half percent (0.4 percent) of the loans would default in an average economy, whereas 5 percent would fail during a severe depression. The rater also assumes that only one-half the value of every defaulting loan is recoverable. These parameters define the dollar size of each successively riskier tranche, thus becoming the foundation of the deal structure laid out in *Exhibit 1*:

- **First-Loss Position.** Riskiest tranche constitutes 0.2 percent of the bond issue (0.4 percent of loan pool x 50-percent loss severity). Generally designated as "unrated." When mortgages default, these investors are the first to sacrifice capital and may lose all principal if total loan losses exceed $200,000 (0.2 percent x $100 million). The position pays the highest return. Here, that translates into a 25-percent yield, assuming a risk premium of 18 percentage points added to a floating-index rate currently at 7 percent.
- **Mezzanine Position.** Moderately risky tranche takes the next hit upon depletion of the junior tranche. The layer represents 2.3 percent of the bond issue (5 percent of loan pool x 50-percent loss severity - 0.2 percent first-loss principal). These investors continue to lose principal until aggregate losses surpass $2.5 million ($0.2 million from first-loss position + $2.3 million from mezzanine). The twofold bet is that the first-loss vanguard will spare mezzanine dollars from expected losses, and that no nasty economic conditions develop before the bond matures. Split into several layers, mezzanine segments typically carry ratings of BB to AA.
- **Senior Position.** Least risky tranche suffers losses only after defaults have exhausted the first-loss and mezzanine principal. As the most insulated layer, the example's $97.5-million tranche affords the lowest risk (8-percent yield), highest credit rating (AAA) and lowest credit spread (1 percentage point). **—Frank Vetrano**

EXHIBIT 1: Simplified Senior-Subordinate Structure



Note: Loss-absorption figures assume that 50 percent of defaulted loan value is recoverable. Yield figures are hypothetical and represent risk-commensurate credit spreads added to a floating-index rate presently registering, for illustration purposes, at 7 percent; mezzanine yield equals weighted average of variously rated pieces in this tranche.
Source: Freddie Mac

By the early 1990s, **nonconforming-mortgage** originators discovered that they, too, could use the capital markets to divest their portfolios of interest-rate risk. That came with the innovation of **senior-subordinate bonds** issued by **private-label securitizers**. These bondholders will accept interest-rate risk in exchange for earning an array of returns tied to different degrees of default risk associated with the underlying mortgages (see "Dishing Up a Senior-Sub To Go," page 19).

Getting a Grip on Mortgage-Default Risk

For years, investors in mortgage-default risk could not reduce credit-risk exposures once the loans were bundled into securities. The mortgage contract prohibits the alteration of any loan characteristics or the outright sale of any underlying loan. That left investors to keep default risk at bay solely by holding borrowers and collateral properties to investment-quality standards and insisting on **mortgage insurance** to stand behind low down payments.

Freddie Mac broke new ground in spring 1998 with the $243-million Mortgage Default Recourse Notes (MODERNs) transaction. The deal represented the first sally at managing mortgage-default risk through the capital markets. Investors in the bond issue are earning interest rates calibrated to offset the default exposure on $20 billion in underlying Freddie Mac mortgages.

Freddie Mac's MODERNs transaction represented the first sally at managing mortgage-default risk through the capital markets.

The transaction, handled by investment banker Morgan Stanley Dean Witter & Co., borrows heavily from techniques used to create catastrophe bonds and senior-subordinate bonds. Although structured like a reinsurance contract, the transaction functions like a mortgage credit derivative.

In concept, the agreement is similar to the one investors make when they purchase subordinate bonds in the nonconforming market. From an economics standpoint, the MODERNs transaction resembles a derivative in that it alters the credit-risk profile of the securitized mortgage portfolio while avoiding direct sale of the underlying loan assets.

The MODERNs deal is a small but important step towards developing an efficient derivatives market for mortgage credit risk. As increasingly refined default hedges command better bid prices, consumers may reap additional mortgage-cost savings.

Many Happy Returns?

Portfolio risk managers appear willing to provide a ready supply of credit-derivative fodder. These risk jugglers have turned out a steady stream of new product applications. They seem to have found in this template the kind of extraordinary hedging tool they have wanted for so long.

Add to that the enormous capacity of the capital markets to absorb credit risk. Last year's turmoil in some of Asia's emerging markets did slow the pace of credit-derivative innovation temporarily. The general acceptance and perceived value of the product did not suffer, though.

Demand could turn sour if an existing bond gets socked with huge losses, although that seems unlikely. Even so, today's lucrative returns could afford to lose some steam yet still remain appealing to capital-market players forever trawling for high-side returns.

Together, necessity and opportunity should ensure continued expansion of the credit-derivatives market.

Besides, who knows? In addition to making the job of portfolio managers a bit easier, all this just might buy them an added measure of ... happiness. SMM

David Thompson, a senior risk analyst in Freddie Mac's portfolio management division, also contributed to this report.