

The Swap-Driven Deal

Banks rarely tell you about trapdoors. But many swap structures have them.

By Keith C. Brown and Donald J. Smith

This decade has seen the development of the swap-driven deal—a set of transactions that probably would never have taken place without the interest rate (or currency) swap. But it isn't only the presence of a large and liquid swap market that makes these deals work. Frequently, it's the pricing of the swap. Some of these structures are well-chronicled. The credit spread arbitrage, represented with its inevitable box-and-arrow diagram, is a theme in virtually every introductory swap presentation. (See "The ABCs of Swaps," *INTERMARKET*, May 1988 for a description of how to arbitrage the price difference between

credit spreads in the fixed-versus-floating-rate markets.) The risks inherent in swap transactions are well-known, but they aren't generally emphasized in market-makers' promotional material. In a swap, each counterparty bears the credit risk of the other. The recent capital adequacy requirements set forth by the Federal Reserve and the Bank of England directly address this type of risk. A corporate user of a swap must evaluate the credit-worthiness of the commercial or investment bank counterparty, as it is itself evaluated. Liquidity risk, too, can influence the corporate end-user. But the

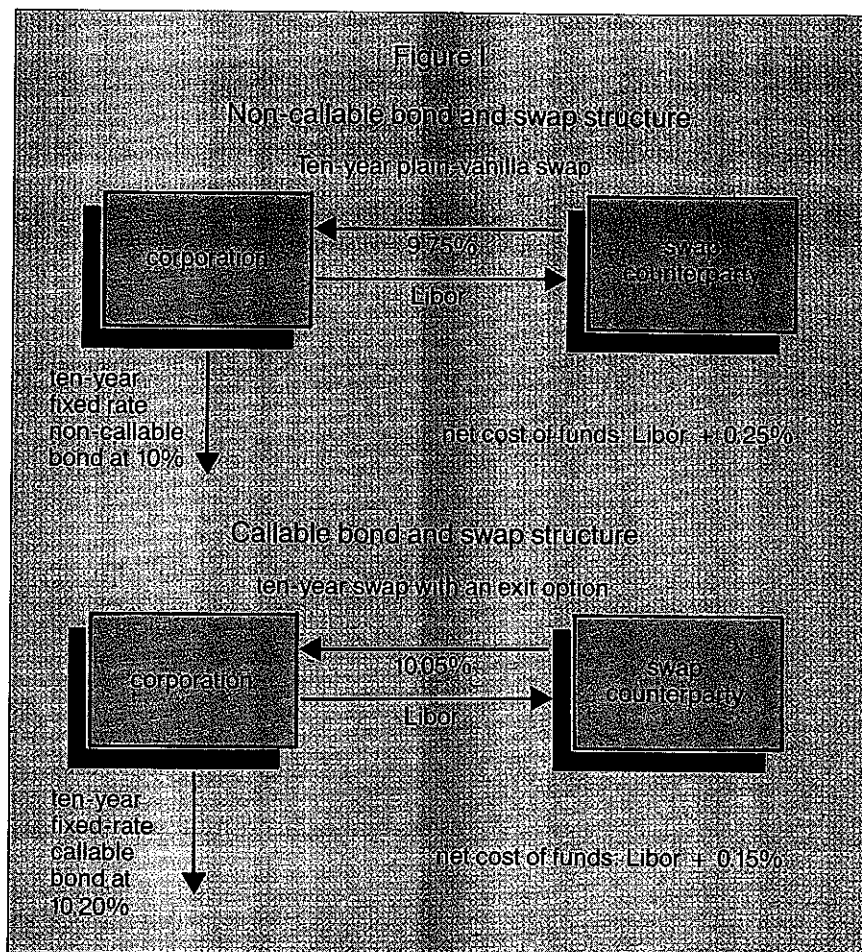
depth of the swap market—now exceeding \$1 trillion in total notional principal—mitigates this risk.

Another potential concern is design risk. A poorly designed swap can easily become a financial burden to the user. A natural, non-arbitrage application for a swap is to hedge interest rate risk for time horizons beyond those of exchange-traded futures. In the early 1980s many thrifts entered plain pay-fixed swaps to hedge the gap between relatively long-maturity mortgage portfolios and short-term deposit liabilities. But many of these hedges were poorly designed. When interest rates fell, mortgage prepayments rose unexpectedly. Some thrifts ended up overhedged, paying what seemed to be too high a fixed rate on swaps that eventually had too high a notional principal. Closing out these positions with unwind swaps would entail taking a significant capital loss. A better design would have offered an exit option that mimicked the prepayment option on the underlying mortgages. Such a swap (called either a *puttable* or *callable swap*—see the accompanying box) would require an up-front fee or a higher pay-fixed rate to walk away without penalty from the swap.

If we use a bit of reverse financial engineering, we can analyze two swap-driven structures and identify some overlooked risks. The first is an arbitrage play on the pricing of call options in the bond-versus-swap market. The second involves using swap options (swaptions) to monetize the value of a call option embedded in a bond. Common to both examples is an assumption about a decision by the swap counterparty. The uncertainty of these assumptions adds an easily overlooked risk.

An arbitrage on the price of call options

The first example comes from a Nov. 20, 1987 *Wall Street Journal* article ("Firms return in force to credit markets with debt linked to interest rate swaps," by Ann Monroe). A corporation issues fixed-rate callable debt priced to yield 20 basis points more than a comparable noncallable issue. Then it enters a receive-fixed interest rate swap to convert to net floating-rate funding. The arbitrage play comes from including an exit option held by the swap counterparty. If the counterparty will pay a fixed rate 30 basis points above a plain-vanilla swap, then the corporation picks up ten basis points in the pricing of options. This lowers its



floating-rate cost of funds against the traditional instrument.

The corporation could issue ten-year, noncallable fixed-rate debt to yield 10% (see figure 1). It could also enter a plain-vanilla ten-year swap to receive 9.75% fixed and to pay Libor. The net floating-rate cost-of-funds—assuming that all rates are quoted comparably—would be Libor plus 0.25%. Assume further that a traditional floating-rate note would require pricing at Libor plus 0.25%, so that no arbitrage play is available with traditional instruments.

Alternatively, the corporation could issue a ten-year bond callable in five years. So it needs a higher yield to encourage investors to take on that risk. Suppose the corporation in effect buys the call option for 20 basis points (so the bond's yield is 10.2%). Then, to obtain the desired floating-rate funding, it enters a ten-year, receive-fixed swap that gives the counterparty a walk-away option after five years. If the counterparty will pay 30 basis points over the plain-vanilla swap fixed rate in return for the option, the corporation's net cost of funds (at least for five years), is Libor plus 0.15%. There's

a reduction in the all-in cost by ten basis points—the product of differential pricing in the call or exit options in the bond versus swap markets.

In this structure the corporation buys an option in one market and sells another in a second market. But the options, while related, aren't identical. The call option purchased by the corporation is tied to its own debt-refunding rate at the fifth year. It will call the debt if its refunding rate is under 10.2%. The option sold to the swap counterparty is tied to the swap fixed rate at the fifth year. The counterparty will exercise its walk-away option if rates fall and it can enter a five-year swap to pay a fixed rate below 10.05%.

Casual analysis of this type of arbitrage assumes that both decision-makers—corporation and swap counterparty—take the same action. But suppose that market rates fall. The corporation calls the debt and the counterparty exits the swap, both for sound financial reasons. The arbitrage gain lasts for five years. Next, suppose that rates rise and neither party can exercise its option profitably. Then the arbitrage gain lasts for ten years. The issue

Figure II

Transactions in year five if the swap rate equals 8.7% and the bond rate equals 8.7%

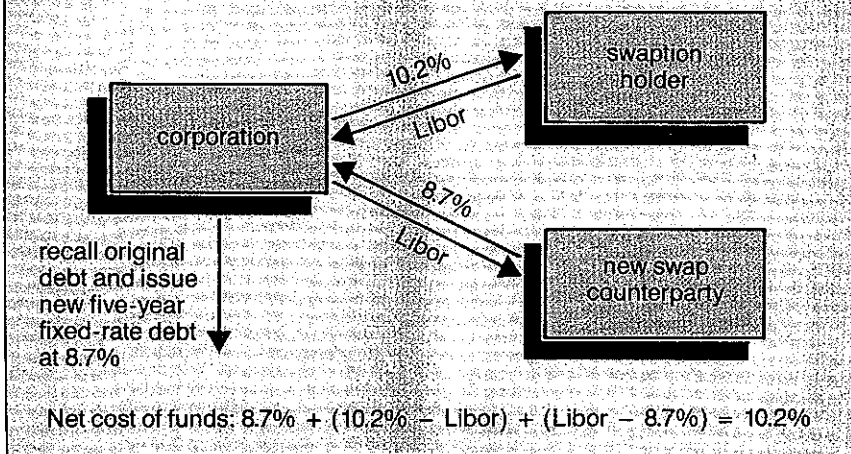
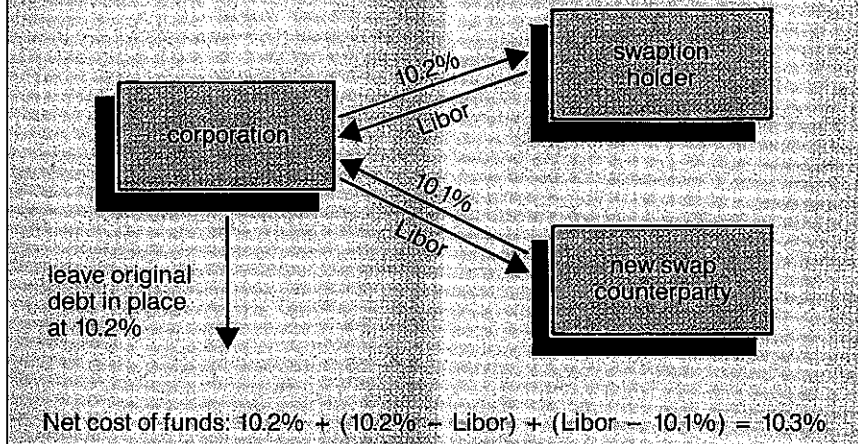


Figure III

Transactions in year five if the swap rate equals 10.1% and the bond rate equals 10.3%



seems only to be how long the ten-basis-point reduction in the cost of funds lasts.

The less obvious risks to the structure are revealed when only one option is exercised. Assume that the corporation's credit standing weakens, Treasury yields fall and the swap spread (the fixed rate on a swap is quoted as a spread over Treasuries) remains steady. It is possible that the corporation can't call its debt. But the swap counterparty gains by exercising its walk-away option. To retain a floating-rate cost of funds, the corporation has to get a new five-year swap. If the best available receive-fixed rate is 9.7% (reflecting the lower Treasury yield), the cost of funds

for the second five-year segment becomes Libor plus 0.5%. Or the corporation could have issued a ten-year floater at Libor plus 0.25%. The arbitrage gain of ten basis points for the first five years is more than countered by the loss of 25 basis points for the second five years.

What happens if the corporation's credit standing and Treasury yields are the same, but the swap spread falls because of changing supply and demand in the swap market? The firm might not be able to call the debt. But the counterparty to the swap may again find it opportune to exit. The corporation has to reenter the swap market, and ends up receiving a lower fixed-rate

than 10.05%. That raises the net floating-rate cost of funds for the second five years, perhaps even erasing the projected arbitrage gain.

So this structure appears to be more than a simple arbitrage play off differential option pricing in the bond versus swap markets. It becomes a play on the firm-specific credit risk against the general market risk embodied in the swap spread. Plausible events can wipe out the initial gain, and, in fact, make the corporation worse off. But events can also improve the corporation. If its credit standing improves, it can call the debt in circumstances when the counterparty won't exit the swap. But, in the final analysis, a deal shouldn't be taken as a simple, sure reduction in the cost of funds.

Monetizing callable debt with swap options

A second example of risk hidden in a swap-based transaction involves the use of swaptions as a hedging vehicle. A swap option is a right to enter into a swap transaction under prearranged terms. Say a corporation issues a ten-year callable bond at a fixed rate of 10.2%. As before, the bond can only be called after five years. Assume the corporation is interested in fixed-rate funding, and that no receive-fixed swap is attached. The firm can refinance the debt in five years if rates are below 10.2%. Suppose that two years pass and interest rates in general have declined. The call option has increased in value, but it can't be sold separately since it's embedded in the bond. And it can't be exercised since three years remain in the deferment period. So the corporation holds what amounts to a nonmarketable, nonexercisable asset.

In the last few years commercial and investment bankers have promoted strategies to capture, or monetize, the value of embedded call options. In its most common usage, call monetization involves the sale of an option that grants the holder the right to enter an interest rate swap.

How would this strategy work? Suppose that, in the two years since the issue of the original debt, bond and swap fixed-rates fell to 8.7% (and are expected to remain at that level). The company then sells an option to a bank counterparty granting the right (but not the obligation) to enter a five-year, receive-fixed swap in three years. If the option is exercised, the corporation

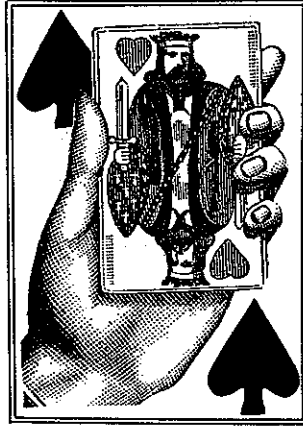
would be the fixed-payer and the bank the fixed-receiver. The agreed fixed rate on the swap is set at 10.2% (equal to the coupon on the original bond) and the notional principal would equal the bond's call price. Since the strike rate on this option is set above prevailing market conditions (i.e., above 8.7%), the buyer of the swaption would be willing to pay the corporation an amount equivalent to the value of the call feature embedded in the original debt issue. The receipt of this up-front premium effectively monetizes the call option value.

What happens when the deferment periods on these options end in three years? The simplest situation to consider is if interest rates in both the five-year swap and bond markets have risen to levels above 10.2%. It wouldn't make any sense for the firm to refinance its debt—or for the swaption holder to enforce its right to enter a receive-fixed swap at a lower rate than it could otherwise obtain. In market parlance, both the call feature on the bond and the swaption are out-of-the-money options. On the other hand, if swap and bond rates remain below 10.2%, then the two options will be in-the-money and, accordingly, will be exercised by their respective holders.

Suppose that the new five-year fixed swap and bond rates are still 8.7%. Then, the corporation will engage in three transactions. First, it will refinance old debt with new fixed-rate debt at 8.7%. Second, the swaption holder will force the firm to enter the swap to pay a fixed rate of 10.2% in exchange for floating-rate Libor. Finally, since these two transactions result in the company paying two fixed rates and receiving one floating rate, the firm will also enter into a separate receive-fixed swap with another counterparty at the prevailing rate of 8.7%. That in effect unwinds—cancels—the other swap.

The all-in cost associated with these transactions is 10.2%, the same as the firm's initial cost of funds. This is expected, of course, since the corporation already sold its right to refinance the original debt with the swap option market (see figure II).

This example again assumes that market conditions force the corporation and the swaption holder to make the same decision in exercising their options. But a hidden risk exists for the firm when interest rate swaps move in a slightly different manner than those on bonds. To see what effect this can have



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on the eventual funding cost, suppose that at the end of year five the bond refinancing rate has risen to 10.3%, while the fixed rate on a swap is 10.1%. As shown in figure III, the corporation would not exercise its right to call the existing debt. But it would still be forced by the swaption holder to enter the

swap. After unwinding the swap, the net cost of funds rises to 10.3%, ten basis points higher than the corporation's original financing rate. The increased cost derives from the swaption being exercised against the firm when the firm itself can't take similar advantage of its call feature.

When the deal was originally structured, the firm obviously didn't know what the relation would be between interest rates in the swap and bond markets at the end of the option deferment period. And what would happen if in year five the swap and bond rates were 9.5% and 9.7%? Even though the call and swap options would be exercised by their respective holders, the all-in cost of funds for the firm would still rise to 10.4%—a 20-basis-point increase over the original level. And remember, this could happen if Treasury rates were to fall when the firm's credit rating is downgraded. Naturally, if the firm's credit quality improved and its bond rate fell below the market swap rate, it would benefit from lower financing costs—despite having monetized its call option. A corporation that attempts to capture the value of a capital market instrument (i.e., the call option embedded in the initial bond) via a swap market transaction is at risk for the decision-making prerogative of the swap counterparty. This again amounts to an implicit play on the relation between the firm's own credit standing and general market conditions.

There can be little doubt that new swap-related products and techniques provide substantial benefit. But they also present new areas of risk exposure. Some sources of swap risk are well understood by market participants. Others remain concealed within the structure of a deal. The success of any transaction involving explicit or implicit sale of options to a swap counterparty necessarily depends on the eventual actions of that counterparty. Built-in uncertainties can have unfortunate consequences for a firm that doesn't allow for that possibility. And when this additional exposure is taken into account, the advantages of some swap-driven deals may disappear. Swaps might make for a cheaper lunch, but they won't make it free. ■

Professor of Finance Keith C. Brown, of the Graduate School of Business at the University of Texas at Austin, and Professor Donald J. Smith, of the School of Management at Boston University, consult on risk management.

Swap talk: the lingo of the swap market

The swap market can be a bewildering array of confusing and nonintuitive terms. What does it mean when a firm "buys a callable swap" or "sells a put option on a puttable swap"? When a firm enters a swap agreement it usually pays nothing. So what has it bought? A swap at origination has no economic value per se, so what has been sold? To clarify these usages, we offer the following explanations.

■ To buy a swap, or to go long in a swap is to enter a swap agreement as the *fixed-payer* (or *floating-receiver*).

■ To sell a swap or to go short in a swap is to enter a swap agreement as the *fixed-receiver* (or *floating-payer*).

A corporate end-user, therefore, buys the swap at the market-maker's *offer* rate (i.e., the fixed rate paid against the floating rate, usually Libor, flat), or sells the swap at the market-maker's *bid* rate. The market-maker naturally offers a higher rate than it bids to cover costs and credit risk exposure, and to make a profit. It might be helpful to think of the floating rate as the commodity bought or sold by the market-maker for a given fixed rate. Naturally, the middle-man wants to buy low and sell high.

This widely used swap terminology reverses usages that are common in the exchange-traded futures market. Suppose a firm buys a swap to pay 10% fixed. It gains on that transaction if market rates rise. Obviously, it receives net settlement payments when Libor exceeds 10%. But, more fundamentally, it gains when a replacement swap fixed-rate for the remaining maturity exceeds 10%. That is, the mark-to-market value of the swap moves from zero at origination to a positive amount. The firm could have obtained the same gain, in principle, by selling a series of interest rate futures contracts. So, buying a swap is like selling futures, and selling

a swap is like buying futures. This seeming contradiction, while real, is only nominal. Swaps focus on rates and futures on prices, and rates and prices are inversely related.

We recommend that swap users refrain from identifying positions as buy, sell, long or short. *Pay-fixed* and *receive-fixed* fully define the side of the transaction that the firm is on and indicate the direction of settlement payments as market rates change.

■ A *callable swap* sometimes means that the *fixed-payer* has the right of early termination without penalty, while a *puttable swap* means the *fixed-receiver* has that option.

These descriptions of callable and puttable are most commonly used in Euromarkets, particularly with London-based swap operations. The logic behind this terminology follows an analogy to bonds with embedded call and put options. The issuer of a callable bond (the payer of fixed coupons) will exercise the option to redeem the debt if market rates fall. Likewise, the fixed-payer on a swap will exercise the right of early termination if rates fall. As the yield on callable debt is always higher than on its noncallable counterpart, the fixed rate on a callable swap would be higher than otherwise.

In the same vein, a puttable swap allows the fixed-receiver to exit prior to maturity—if, for example, the swap market rates have risen. Similarly, the holder of a bond that has an attached put option (i.e., a receiver of fixed coupons) will exercise that option if rates rise. The investor in a puttable bond must accept a lower yield than otherwise. The fixed-receiver on the swap must accept a lower fixed rate, or pay an up-front fee, on a puttable swap.

Unfortunately, these usages for "callable" and "puttable," while following familiar terrain, do not fit well. A firm that goes long in a callable swap pays the fixed rate and has the right of early termination. It first buys the swap

and then has an option to sell—or put—it back to the counterparty. A call option that confers the right to put is inherently confusing. Likewise, a puttable swap allows the seller of the swap (the fixed-receiver) to buy back, or call, the swap. So, in effect, the put option confers the right to call.

For these reasons it would be better if swap users didn't refer to their swaps as *callable* or *puttable*. An *exit*, or *walk-away*, or *close-out* option is more descriptive. A firm is either the fixed-payer or fixed-receiver on swap. If the firm has an exit option, it either pays a higher, or receives a lower, fixed rate than on the plain-vanilla variety.

■ A *call option on a swap* usually means the owner of the option has the right to enter a swap as a *fixed payer*, while a *put option* means that its owner has the right to enter as a *fixed receiver*.

These are swap options (or swap-tions) in that they confer a right, but not the obligation, to enter the prescribed transactions. If the owner of an option chooses to exercise, the writer (the original seller) of the option is obligated to take the opposing position in the swap. The call writer is obliged to become the fixed receiver and the put writer is obliged to become the fixed payer. If it is any comfort, these usages conform to the notion that "to call is to buy is to pay-fixed" and "to put is to sell is to receive-fixed."

Again we recommend that swap-users refrain from naming their options to enter swaps as *calls* and *puts*. *Entry*, or *take-down* options avoid confusion. While there may be a certain, obscure flair to announcing that you have bought a call option on a callable swap, it would be clearer to say that you have acquired an option to enter a pay-fixed swap that allows for early exit. — K.B. and D.S.