

CMBS Total Return Swaps

Offered on attractive terms so far.

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The total return swap market has been a key financial market innovation. It gives portfolio managers new freedom by allowing them to reduce the costs associated with either obtaining exposure to a market sector or hedging an exposure. For private commercial real estate equity, there is now a new swap product based on the NCREIF Property Index, yet to be tested in the market (see Fisher [2005]).

For commercial mortgage-backed securities (CMBS), several dealers offer swaps on various CMBS indexes and their subsectors. We describe these CMBS swaps and their mechanics, and address the economic rationale as to why the market has offered attractive terms to those who want exposure to a CMBS sector.

TYPES OF CMBS TOTAL RETURN SWAPS

In a total return swap (TRS), one party makes an interest payment to a counterparty in exchange for the total return realized on a reference asset. The total return of a reference asset includes all cash flows that are thrown off by the asset as well as the capital appreciation or depreciation of the reference asset. The interest payment is generally a floating rate based on a reference rate (typically LIBOR) plus or minus a spread.

The party that agrees to make the floating-rate payments and receive the total return is referred to as the *total return receiver* or *the swap buyer*; the party that agrees to receive the floating-rate payments and pay the total return is referred to as the *total return payer* or *swap seller*.

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The reference asset could be a credit-risky bond, a loan, a reference portfolio consisting of bonds or loans, an index representing a sector of the bond market, or an equity index.

One can think of a TRS as composed of two legs: 1) the long leg, and the 2) financing leg. The long leg is economically equivalent to a long (ownership) position in the reference asset for the TRS; the financing leg is the cost of acquiring that position. Thus, from the perspective of the total return receiver, a TRS is a leveraged position in the reference asset. The receiver achieves the same economic effect as it would if it borrowed money and used those funds to purchase the reference asset. That is, the receiver pays a borrowing rate and receives all interim cash flows and the mark-to-market on the reference asset. From the perspective of the total return payer, a TRS position is economically equivalent to shorting (selling) the reference asset.

The reference asset may be either the Lehman or Bank of America CMBS Index or a subsector.¹ The Lehman CMBS Index is quite broad, and not all its securities are eligible for inclusion in the very popular Lehman Aggregate Index. As the receivers on TRS tend to be money managers who are seeking an exposure to the reference asset, the three subsectors of the Lehman CMBS Index that have active markets in CMBS TRS are:

- CMBS eligible for the Lehman Aggregate Index. The CMBS Index is a broad, investment-grade index. It contains both publicly offered and 144A (private) transactions, ERISA eligible and non-eligible securities. Only the ERISA eligible, publicly offered securities, constituting about 85% of the securities in the CMBS Index, are eligible for inclusion in the Lehman Aggregate Index.
- The AAA component of the Lehman CMBS Index. Approximately 85% of the index is rated AAA; the remaining 15% consists of investment-grade securities rated below AAA. This subsector is very similar to the subsector consisting of CMBS eligible for the Lehman Aggregate Index.
- The AAA 8.5+ year subcomponent of the index, which represents about 12% of the index.

DEAL MECHANICS

The term for a swap is generally six months, but shorter and longer periods can be negotiated. The frequency of settlement for a CMBS TRS is monthly. This

means that at the end of each month, the payments for the two parties are determined, and payments are exchanged.

The total return on the CMBS Index has two components: 1) income on the CMBS Index, and 2) capital gain or loss on the CMBS Index. The income on the CMBS Index can be approximated by its yield. Note that this is only an approximation of the income, as it ignores any paydown on the premium-priced securities in the index. The price (capital) loss (or gain) can be approximated by the [(change in the yield on the index) $\times$ (the modified duration of the security)].

To demonstrate this relationship, we assume for the Lehman CMBS eligible for the Aggregate Index:

- The yield is 4.60%.
- The yield declines by 20 basis points because the market rallies and CMBS spreads remain roughly constant.
- The duration of the index is 4.53 years.

Then, each month, an investor would receive $\frac{1}{2}$ of the 4.60% or \$0.00383 per dollar notional amount plus the gain in the price of the index. The gain would be $\$0.002 \times 4.53$, or \$0.0091 per dollar. Thus, an investor would receive $(\$0.00383 + \$0.0091)$, or \$0.01293 per dollar notional on the swap. On a \$70 million swap, the swap receiver would be entitled to receive $\$0.01293 \times \$70,000,000 = \$905,100$.

Typically in a CMBS TRS, the total return receiver pays a floating reference rate (generally indexed to LIBOR). The formula for computing the payment to be made by the total return receiver is:

$$(\text{Reference Rate} \pm \text{Spread}) \times (\text{Actual Days in Month}/360) \times (\text{Notional Amount})$$

Suppose for a \$70 million notional amount CMBS TRS with a spread of -35 basis points the reference rate is 3.2% at the settlement date. Suppose that the month has 30 days. Then the payment made by the total return receiver is:

$$(0.032 - 0.0035) \times (30/360) \times \$70,000,000 = \$166,250$$

The payments between the two parties are netted. In our example, the TRS receiver would net \$738,850 $(\$905,100 - \$166,250)$. In this example, the spread to LIBOR is negative. This is often the case (for reasons explored below). Also in this example, interest rates had

fallen so the price performance of the TRS was positive. It is possible for the price performance of the CMBS Index that is used as the reference asset to be negative enough that the TRS receiver actually makes a payment based on the negative return in addition to the interest.

The risks faced by investors in a TRS transaction are counterparty risk, liquidity risk, and margin call risk. Counterparty risk can be mitigated using the standard risk management practices in the swap market, such as netting, marking to market, and collateral.

In the case of liquidity risk, all CMBS TRS are traded by a number of dealers and can be unwound before the maturity date (although as in any market there is no assurance that liquidity will be available in the presence of severe market stress if an investor seeks to unwind a trade before the maturity date).

Margin call risk is the risk that additional collateral must be posted if a margin call is triggered by an adverse price movement in the collateral. In many cases, the margin call risk is mitigated by standard risk management practices (such as daily settlement of mark-to-market changes).

ECONOMICS OF A CMBS SWAP

In any TRS, if the total return payer owns the reference asset, it has transferred its economic exposure to the total return receiver. Effectively, then, the total return payer has a neutral position that typically will earn the reference rate plus or minus a spread. The total return payer has only transferred the economic exposure to the total return receiver, however; it has not transferred the actual asset. The total return payer must continue to fund the reference asset at its marginal cost of borrowing or at the opportunity cost of investing the capital tied up by the reference asset elsewhere.

Commercial loan originators and dealers use this derivative product to hedge their economic exposure while they are accumulating commercial mortgage loans to use in a future securitization. The economic exposure that dealers face is credit spread risk and interest rate risk. The former is the risk that credit spreads will widen, resulting in a decline in the value of the warehoused loans. The latter is the risk that the general level of interest rates will rise, resulting in a decline in the value of warehoused loans.

From the perspective of the total return receiver, a TRS provides a much more efficient means of acquiring an economic exposure to the reference asset than actually purchasing it. A total return manager seeking expo-

sure to the CMBS market can, by buying a CMBS TRS, achieve in one transaction the same economic exposure to this sector that would otherwise take several cash market transactions to achieve. In addition to its transaction cost savings, a TRS on a CMBS Index also allows elimination of the idiosyncratic risk a portfolio manager faces in constructing a portfolio of CMBS relative to a target CMBS index.

Moreover, the total return receiver does not have to arrange financing to purchase the individual holdings to replicate the target CMBS index. Instead, financing is obtained within the transaction when the total return receiver makes the interest payment to the total return payer in exchange for receiving the total return on the CMBS Index.

In the CMBS market, the financing advantage has been particularly attractive. Historically, dealers commonly offer CMBS TRS at financing rates below LIBOR (i.e., the total return receiver pays a rate lower than LIBOR). The financing rate has been considerably more attractive than is available for generic collateral when financing in the repo market.

For example, in early May 2005, for the subindex consisting of CMBS eligible for the Lehman Aggregate Index, the total return receiver paid 35 basis points *below* LIBOR. We have seen this spread as narrow as 5 basis points and as wide as 50 basis points. Meanwhile, on the same date, for the 8.5+ year subcomponent of the index, the total return receiver was able to pay 50 basis points below LIBOR to receive the total return. We have seen this spread as narrow as 30 basis points and as wide as 70 basis points. As long as dealers offer CMBS TRS at financing rates below LIBOR, TRS is the best way to own the asset class.

Even though the term for a CMBS swap is generally six months, the swap can be renewed at the end of that period at the then-market terms (sub-LIBOR financing has been the norm). Thus, for many asset managers facing these swap terms, a CMBS TRS should be the preferred method for adding CMBS exposure to a portfolio.

The reason for the favorable financing is that dealers have discovered that CMBS TRS are the most risk-efficient way to hedge CMBS new issue and secondary positions. To understand why, consider the protection afforded a dealer with a long CMBS exposure by hedging using interest rate swaps versus CMBS TRS. The risks that the dealer faces are interest rate risk and credit spread risk. In a CMBS TRS, the dealer is hedging both interest rate risk and credit spread risk. In an interest rate swap,

the dealer is hedging against only the interest rate risk.

While CMBS spreads versus Treasuries are highly correlated with interest rate swap spreads, they are not perfectly so. One period of disconnect was in 1998. At that time, CMBS spreads to Treasuries rose about 60 basis points more than interest rate swap spreads over a short period of time. This left CMBS dealer desks holding swaps that they were using for hedging with large losses. These large losses would not have occurred if dealer desks had used CMBS TRS because the change in CMBS spreads would have been hedged.

Risk management professionals at dealer firms tend to size risk limits according to historical studies of high turbulence periods such as 1998, so using CMBS swaps as a hedging vehicle allows dealers to hold larger positions than would be possible by using interest rate swaps. CMBS total return swaps are also used by originators to hedge commercial mortgage loans being warehoused for securitizations.

In short, dealers and originators are willing to pay the total return on the CMBS index and receive a rate considerably lower than LIBOR because there is no other way to short CMBS. Moreover, by shorting CMBS, dealer desks can accumulate larger positions for securitization than otherwise would be the case. It is the interplay of the dealers and originators looking to pay the total return on the CMBS Index coupled with investors looking at this as a very efficient way to buy CMBS that determines the pricing (spreads) of CMBS total return swaps.

There is no assurance such an attractive funding opportunity will continue, of course. Financial market innovations could result in improved mechanisms for shorting CMBS that will reduce or eliminate the funding advantage. For example, market participants have used the credit default swap (CDS) market to hedge exposure to the credit spread risk of individual corporate bonds, a basket of corporate bonds, or a credit-risky bond sector.

An important contributing factor to the growth of the CDS market has been the standardization of documentation by the International Swaps and Derivatives Association (ISDA). Once documentation becomes standardized for CMBS, and dealers and originators become comfortable with using CDS for hedging, the funding advantage may be reduced.

Nevertheless, even if the funding advantage does not continue, CMBS TRS are a capital market instrument that allows for altering exposure to the CMBS sector in an efficient manner.

DURATION-NEUTRAL CMBS TRS

For a total return investor whose benchmark is a CMBS index or an investment-grade index such as the Lehman Aggregate, a CMBS TRS is an efficient way of going long or short the index. The total return of the index will reflect changes in both the level of interest rates (as measured by swap rates) and CMBS credit spreads relative to swaps. If an investor wants to bet on movements in the credit spread alone, however, the basic CMBS TRS does not do it. For example, suppose an investor believes credit spreads will decline and thus wants greater exposure to a CMBS index. If the credit spread declines at the same time that the general level of interest rates rises, the investor could realize a negative return despite the correct expectations.

Investors who cannot afford this degree of mark-to-market volatility (due to the large mark-to-market moves caused by changes in interest rates inherent in a TRS) can still take advantage of favorable sub-LIBOR financing rates. This can be done by putting the CMBS TRS together with an equal dollar duration plain vanilla interest rate swap, where the investor pays a fixed rate and receives a floating rate. In this case, the investor retains the risk that the CMBS spreads will widen relative to swaps, causing mark-to-market losses, while eliminating the mark-to-market implications of the change in swap yields. That is, the investor has duration-hedged the CMBS total return swap.

This is particularly appealing to investors who face investment restrictions based on accounting considerations. Consider, for example, an insurance company, where security positions are accounted for at amortized cost (not at market value). The CMBS TRS is accounted for as a derivative, is marked to market periodically, and will generate gains and losses when they are not necessarily desired.

That is, if interest rates fall, the value of the CMBS Index will rise, and the entire increase in the index will be paid to the TRS receiver, and taken into income immediately. Similarly, if interest rates rise, the position will generate losses that may be high enough that the TRS receiver actually has to make a further payment to the swap counterparty. By using a duration-hedged CMBS swap, the mark-to-market will be based on the changes in the spread changes between the CMBS Index and swaps, not the much larger yield changes in the CMBS Index.

While a duration-hedged CMBS swap can be documented as a single transaction, or via two separate trans-

actions, it is customarily documented as a single transaction and is called a *duration-neutral CMBS TRS*.

Economically, there are three sources of return on this duration-hedged swap transaction:

1. The yield differential between the CMBS Index and the swap rate. We refer to this as the spread to swaps of the CMBS Index.
2. The price effect of the change in that spread.
3. The sub-LIBOR financing.

Mathematically:

$$\begin{aligned} \text{Duration-Hedged CMBS Swap} = & \\ \text{CMBS Spread (to Swaps)} + & \\ (-\text{Change in CMBS Spread} \times \text{Modified Duration of} & \\ \text{the Index}) + & \\ \text{CMBS TRS Sub-LIBOR Spread} & \end{aligned}$$

BREAK-EVEN SPREAD WIDENING

Break-even spread widening is a measure of how much CMBS spreads can widen versus swaps, and allow the receiver of the duration-neutral CMBS TRS to come out ahead. That is, the receiver on the CMBS swap really has two sources of incremental yield—the spread and the sub-LIBOR financing. The question is how much spreads can widen before the second effect—the price change caused by this spread widening—offsets the benefits of the incremental yield.

For each of the total return swaps, the Exhibit shows both the CMBS spread and the sub-LIBOR swap level on the CMBS swap using data as of early May 2005.² By adding these two variables, we obtain the total spread pickup from the swap. Dividing this by the duration of the index, we obtain the break-even spread widening over the course of one year. Thus, if for the CMBS securities included in the index, the CMBS nominal spread is 26 basis points and the CMBS sub-LIBOR spread is 30 basis points, the total spread pickup is 56 basis points (26 + 30). Dividing this by the duration of 4.53 gives a break-even spread widening for a one-year horizon of 12.4 basis points, or 6.2 basis points for a six-month horizon.³

Note that the break-even on the CMBS AAA 8.5+ Index, at 10.7 basis points in a one-year horizon (5.4 basis points in a six-month horizon), is lower than that on the CMBS Index Eligible because the CMBS AAA 8.5+ index has a higher duration (7.27 versus 4.53). Moreover, note that the break-evens will be lower for shorter hori-

EXHIBIT

CMBS Total Return Swap Break-even Widening Spreads

	Eligible for U.S. Aggregate Index	Subsector
		AAA 8.5+
CMBS Nominal Spread	26.00	30.00
CMBS TRS SubLIBOR Spread	30.00	48.00
Total Spread Pickup	56.00	78.00
Duration	4.53	7.27
Break-Even Spread Widening		
1-Year Horizon	12.36	10.73
6-Month Horizon	6.18	5.39

zons. Thus, over the course of a six-month period, the break-even would be only half of that in a one-year horizon. Intuitively, spreads can widen only half as much in six months, as the income for a six-month period will be half of that for a year.

This break-even widening, while clearly not risk-free, seems to represent a good risk-return trade-off. That is, the spread on the shorter CMBS Index in this example is 26 basis points. The break-even widening in a one-year horizon is 12.3 basis points. Thus, spreads must be wider than 38.3 basis points on this CBMS Index before the investor loses money. For example, between January 2003 and August 2005, at the time of this writing, spreads have been wider than this only 12% of the time.

CONCLUSION

The CMBS total return swap market offers investors a way to gain exposure to the CMBS sector, while eliminating the idiosyncratic risk between a CMBS cash portfolio and the CMBS indexes. From an issuer's point of view, CMBS TRS offer a vehicle that allows for improved hedging of CMBS loans prior to securitization. If an issuer hedges with swaps, the CMBS spread risk would be left unhedged. As a result of this dealer and originator need, it is often more attractive for investors to participate in the CMBS sector through the swap market than through the cash market.

ENDNOTES

The authors thank Susan Wilson-Hudson for helpful comments.

¹The two CMBS indexes are compiled and published by two dealer firms. The indexes are determined, composed, and calculated by Lehman and Bank of America without regard to any dealer firm or the total return swap product.

²Because the AAA component is very close in composition to the CMBS eligible index and trades at the same level, we do not look at it separately in the break-even spread widening analysis.

³Execution of the CMBS swap in duration-hedged form is generally a bit less attractive than in unhedged form. We allow for this by assuming a sub-LIBOR spread of 30 basis points, rather than the 35 basis point unhedged trading level.

REFERENCE

Fisher, Jeffrey D. "New Strategies for Commercial Real Estate Investment and Risk Management." *The Journal of Portfolio Management*, Special Real Estate Issue, 2005.

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