# Using Interest Rate Swaps to Hedge Fixed-Rate Assets

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## Investing in Fixed-Rate Assets

The commercial mortgage-backed securities (CMBS) marketplace has grown from its infancy a decade ago to over $80 billion in U.S. issuances annually. As CMBS issuances grow both in size and volume, so does the diversity of the asset classes and the classes of risk. Demand for these securities have been broad based. In addition to CMBS, the last several years have seen growth in other real estate based fixed-rate assets, including B-notes, mezzanine loans and collateralized debt obligations (CDOs).

Investors have their own criteria to determine the appropriate amount of return necessary for a specific portfolio, the type of funding to purchase the asset, and the resulting hold or exit strategy. This article will focus on effective hedging strategies for CMBS or other real estate fixed-rate assets based upon an investor's funding source and exit criteria.

Coupled with investment in fixed-rate assets is the potential exposure to floating rates. Exposure may arise from funding with floating rate debt to purchase fixed-rate assets—an asset-liability mismatch. In addition to the asset-liability mismatch, investors face the risk that their assets' values will decline with rising rates.

The drivers of these risks are two-fold: underlying interest rates (both short- and long-term) and credit risk. While credit risk can be mitigated through such derivatives as credit default swaps, we will not concentrate on credit risk in this article. Underlying interest rates can be effectively hedged through the use of interest rate derivatives such as swaps.

## The Purpose of a Hedge

Before delving into the details of interest rate swaps and their uses for fixed-rate investors, it is important to consider the purpose of hedging. Firms hedge to mitigate risks that may cause undesirable outcomes on the business objectives. This risk mitigation, though, is not free. In return for either banded or known returns, the investor pays a price, either upfront or over time.

An effective interest rate hedge leaves the investor with known return outcomes in various interest rate scenarios. This article will explore how interest rate swaps can fill this role.

## Interest Rate Swaps

An interest rate swap is an agreement between two parties to exchange a string of fixed-rate interest payments in return for a string of floating rate interest payments. Typically, no principal is exchanged at either the front or back end of a vanilla interest rate swap.

The fixed-rate is set so that the present value of the fixed payments is equal to the present value of the currently expected floating payments. Therefore, the value of the swap is zero at inception. Chart 1 shows how the payments are exchanged in the typical fixed/floating interest rate swap.

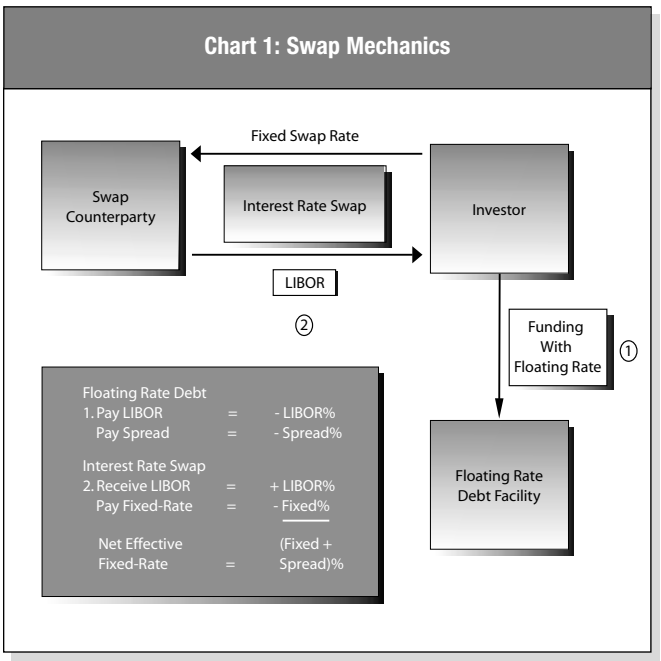
First, a floating rate debt facility is put in place with interest payments of LIBOR plus the borrowing spread. Second, a swap is entered into such that the investor will receive LIBOR while paying a fixed swap rate. Thus, the all-in fixed-rate is the swap rate plus the borrowing spread. The floating rate debt has been synthetically converted to fixed-rate debt.

The value of a swap is driven by where you can replace your position in the marketplace, similar to yield maintenance on fixed-rate loans. For example, an investor is paying a 4.50% fixed-rate on a swap that matures in five years. One year from today, the investor chooses to terminate the swap. At that time, if the replacement swap rate is higher than the investor's obligation to pay over the remaining four years, the swap is an asset to the investor. If the replacement rate is lower than 4.50%, then the swap is a liability.

## Example Asset

For purposes of this article, we will use an example asset of an interest only $50 million fixed-rate asset with a fixed-rate of 8.00% maturing in five years. The asset is priced at par at a spread of 380 basis points (bp) over the 5-year swap rate (4.20%). As noted above, we will not

**Chart 1: Swap Mechanics**




consider the credit risk associated with this asset but rather will focus on using interest rate swaps as means to hedge the various risks associated with investing in fixed-rate assets.

## Identifying the Risks

The key to properly hedging fixed-rate assets is identifying the major risks associated with holding such assets. Generally, the risks that need to be hedged are driven by the type of financing used to fund the asset purchase and the hold or exit objectives.

The most appropriate hedging strategy for an investor is driven by a number of factors. These factors can include the investor's risk tolerance, financing strategy and the exit strategy. Below are three common investment objectives when holding fixed-rate assets and the associated risks.

- **Hold to Maturity.** If the intent is to hold the asset to maturity and finance with floating rate debt, risk exists to rising rates that will erode the earned spread over time. One commonly utilized hedging strategy in this scenario is Asset Liability Management (ALM) Hedging.

- **Resale.** If the intent is to sell the asset as a whole, risk exists regarding the value of the asset at the time of sale. Value is primarily driven by underlying interest rates and the then-negotiated spread. The most effective hedging strategy is Value Hedging.

- **Securitization.** If the intent is to pool the asset with others and match fund with a securitization, the goal of hedging is not necessarily the same as described above. For example, the investor may want to hedge the proceeds from issuance of the CDO or the overall cost of debt. In these cases, the risk is identified by analyzing the securitization structure and determining how this changes in value as rates change from today to the issuance date. Changes in subordination levels, spreads, and investor demand for fixed or floating rate paper can have significant impacts on the effectiveness of any hedge of a securitization. While risks abound, the nuances involved in hedging securitization executions cannot be fully contemplated in this article.

This article will concentrate on ALM and Value Hedging. Without a clear idea of the exit strategy, or at least a set of bounded parameters, it is very difficult to ensure that any hedging strategy will be effective. Once an exit strategy is selected for the asset, the hedges can then be structured to meet the investment objectives.

## Hedge Structure and Effectiveness: ALM Hedging

One common investment strategy is to identify and purchase an attractive fixed-rate asset and then to hold the asset until maturity. If the purchase is funded with a fixed-rate liability, then interest rate risk is removed. It is common, however, to fund the asset with floating rate warehouse debt. The mismatch between the floating rate debt and the fixed-rate asset creates a funding mismatch. This difference creates an increased return while floating rates are low but also introduces the risk that the earned spread decreases as short-term interest rates rise.

Using the example asset described above, we highlight the potential risks and an effective hedge strategy. Assume that the advance rate (leverage ratio) is 70% for illustrative purposes. Further assume that the floating rate facility is priced at 200 bp over 1 month LIBOR.

When matching assets and liabilities, the investor has the choice of (1) fixed assets with fixed liabilities or (2) floating assets with floating liabilities.

- **Fixed-Fixed ALM Hedging.** The investor will synthetically convert the floating rate debt into fixed-rate debt by executing an interest rate swap that has the same notional as the amount of leverage used to purchase the asset. In this case, the investor uses $35 million of leverage to purchase the $50 million asset. Since the debt service and the asset income is locked, the investor has known cash flows over time.

- **Floating-Floating ALM Hedging.** The investor will convert the fixed-rate asset into a floating rate asset by entering into a swap to pay fixed and receive floating on the notional amount of the asset ($50 million). Now, the asset and debt are both floating

**Chart 2: Hedging Fixed-Rate Assets: ALM Hedging**

| Assumptions | |
|---|---|
| Asset Face | $50,000,000 |
| Term | 5 Years |
| Asset Coupon | 8.00% |
| Advance Rate | 70% |
| Borrowing Rate | 1 month LIBOR + 2.0% |
| Swap Rate | 4.20% |

| LIBOR | Net Interest (Fixed-Fixed) | Net Interest (Floating-Floating) |
|---|---|---|
| 2.00% | 152,500 | 125,000 |
| 3.00% | 152,500 | 137,000 |
| 4.00% | 152,500 | 150,000 |
| 5.00% | 152,500 | 162,500 |
| 6.00% | 152,500 | 175,000 |

**Chart 3: Hedging Fixed-Rate Assets: Value Hedging**

| Assumptions | | | |
|---|---|---|---|
| Asset Face | $50,000,000 | | |
| Term | 5 Years | | |
| Asset Coupon | 8.00% | | |
| Sales (Years Forward) | 1 Year | | |
| Swap Rate | 4.20% | | |
| Assumed Spread at Sale | 3.50% | | |
| Hedge Ratio | 93.93% | | |

| 4-Year Swap Rate (1-Year Forward) | Asset Value | Hedge Value | Net Value |
|---|---|---|---|
| 2.20% | 54,104,610 | (3,593,447) | 50,511,163 |
| 3.20% | 52,275,212 | (1,761,124) | 50,514,088 |
| 4.20% | 50,514,989 | - | 50,514,989 |
| 5.20% | 48,821,208 | 1,692,784 | 50,513,991 |
| 6.20% | 47,191,244 | 3,319,968 | 50,511,211 |

rate. Since the asset is of a higher notional amount than the liabilities, though, the investor has the potential to earn higher income as rates increase.

Chart 2 lists the net monthly interest payment in different short-term interest rate environments when using either Fixed-Fixed ALM Hedging or Floating-Floating ALM Hedging. In each scenario the asset generates $333,333 of monthly revenue. When utilizing the Fixed-Fixed ALM Hedging structure, the net monthly interest less the swap payment and credit spread payment will be $152,500—regardless of where LIBOR is set for the month. Both assets and liabilities are fixed in this scenario and the associated interest rate risk is removed.

On the other hand, using a Floating-Floating ALM Hedging structure will allow the investor to benefit from rising rates. As Chart 2 shows, the mismatch in notional amounts between the debt (70% advance) and asset manifests itself in a changing earned spread over time.

Floating-Floating ALM Hedges will tend to perform better as floating rates increase but will be outperformed by liability hedges when rates are lower if evaluated from a pure income standpoint. The decision drivers for selecting either of the ALM Hedging strategies can range from tax or accounting restrictions to a view on rates. Certainly properly evaluating the opportunity costs in the short term should be considered also.

## Hedge Structure and Effectiveness: Value Hedging

As opposed to holding assets to maturity, investors may choose to purchase assets with the intent to sell at some point in the future. This is especially applicable to those anticipating strong performance of the assets with an expected decrease in spreads. The risk is two-fold in this case:

1. Risk of short term rates increasing, which reduces the net interest earned while the asset is owned and financed on a floating rate basis.

2. Risk of value of security going down between time of purchase and time of sale.

The second risk is much more significant than the first, and as such the effective hedge strategy will address this value-based risk.

Assume that the intent is to sell the asset in 12 months. Initially, the asset was purchased at a spread of 380 bp over the 5-year swap rate for a par price. In the interim the investor finances the purchase on a floating rate basis with a 70% advance rate priced at LIBOR + 200 bp. Also assume that the investor will sell the asset at a spread of 350 bp over the then-current 4-year swap rate (implying a decrease in spreads of 30 bp from the original investment).

Broadly speaking, using an interest rate swap in this scenario can hedge the underlying risk of the 4-year swap rate increasing 12 months forward, but it cannot hedge the spread risk. In other words, it must be assumed that the asset will be sold at 350 over swaps—if this does not materialize, the swap will not make the investor whole for any changes beyond the original assumptions.

By executing a 5-year swap today, the investor ensures that the value of the asset is hedged from today going forward. Unlike the ALM hedges, it is more difficult to determine the appropriate notional amount of the swap. The main objective is to structure a swap that has the same sensitivity to changes in rates as does the asset at the expected time of the sale. The appropriate hedge amount in this case is to execute a

swap that has roughly 94% of the notional of the asset. This hedge ratio will be different for different assets and in different interest rate environments.

Using the hedge ratio calculated above, the effectiveness of the hedge is calculated in Chart 3. The main objective is to remove the risk of changing 4-year swap rates at the time of sale. As Chart 3 displays, the net portfolio value is relatively constant regardless of changes in the 4-year swap rate at the time of sale.

## Other Considerations

Both the ALM and Value hedge examples are relatively simplistic and ignore several important considerations (e.g., prepayment characteristics of the asset). In addition, there is no black box solution that indicates the strategies outlined in this article are the only possible ways to hedge fixed-rate assets.

Given the myriad hedging alternatives, it is imperative to spend time vetting a hedging strategy. Drivers of the final hedge strategy will be limited to not only economics, but also accounting and tax rules—what may work economically may not work from a tax or GAAP perspective. Specifically, REITs or public companies may need to consider these areas more so than others.

## Summary

Often, investing criteria will drive the most effective hedging strategy. While this article only covered the use of interest rate swaps, fixed-rate asset investors may want to consider other hedging structures such as caps, collars or swaptions. Each of these alternatives has its own advantages and disadvantages, and only the investor can decide which is best given its business plan. Regardless of the chosen hedging strategy, using interest rate derivatives properly can help mitigate risk on a portfolio of fixed income assets. ❑

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