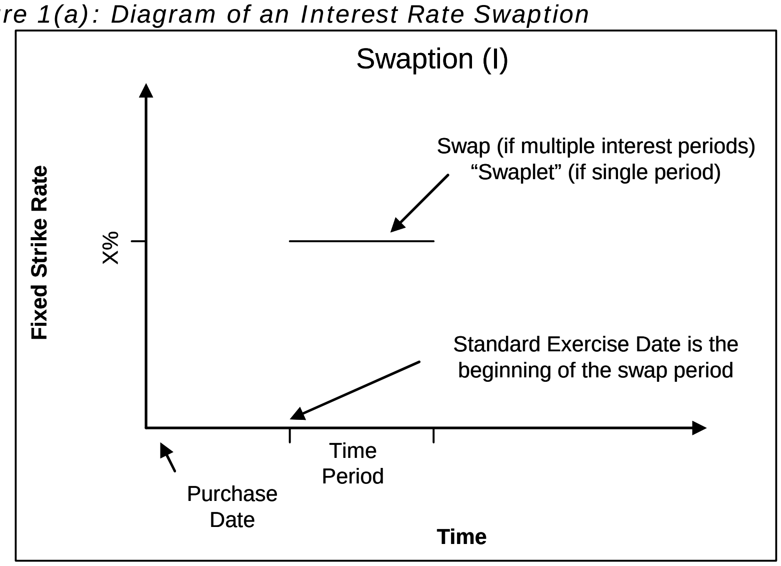
STEP-BY-STEP INTEREST RATE DERIVATIVES DESCRIPTIONS

Interest rate swaption

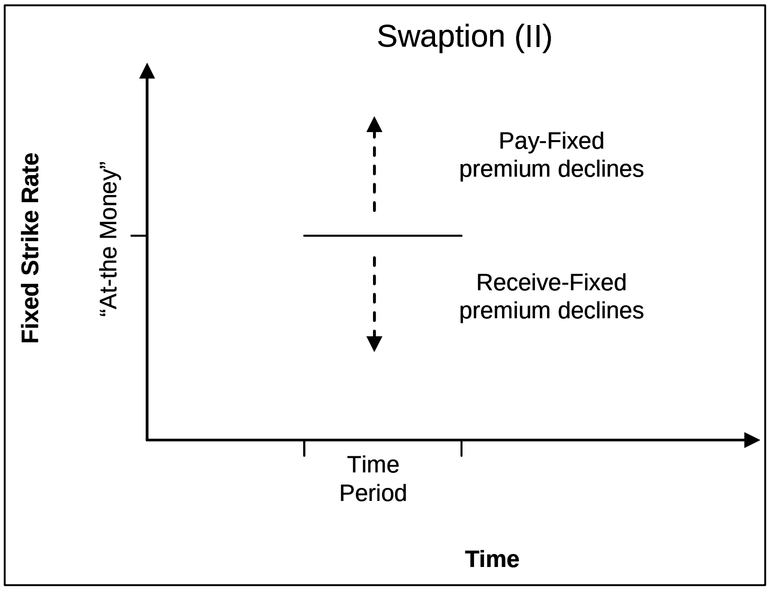
Most people correctly guess that a swaption is an option on an interest rate swap. By definition, swaptions are over-the-counter ("OTC") purchased contracts giving the buyer the right, but not the obligation, to pay (or receive) a fixed rate of interest and to receive (or pay) a floating rate of interest over a defined term. This term can contain many periods in which future payments are exchanged, or it can be a single period. A "pay-fixed" swaption protects its purchaser from interest rates rising above a chosen rate, the "strike rate." Likewise, a "receive-fixed" swaption protects its purchaser from falling interest rates. The cost ("premium") of the swaption depends on several factors; but for otherwise equivalent pay-fixed swaptions the lower the fixed rate, the higher the swaption premium.

Figure 1(a): Diagram of an Interest Rate Swaption



The opposite dynamic holds for receive-fixed swaptions. The interest rate at which the cost of a pay-fixed swaption equals the cost of an otherwise equivalent receive-fixed swaption is referred to as the "at the money" swap rate for that period.

Figure 1(b): Diagram of an Interest Rate Swaption

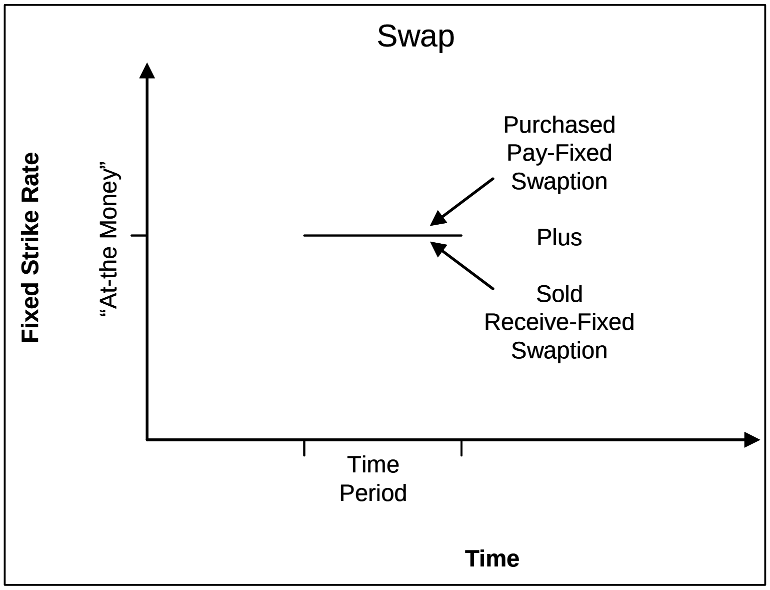


Importantly, at any given time for a defined future period of time in a particular currency, there is a unique swap rate that is at the money. The strike rate for a swaption is normally referred to as a certain distance from this rate. For example, 25 basis points "out of the money" means 0.25 per cent higher than an "at the money" swap rate for a pay-fixed swaption, or 0.25 per cent lower than the at the money swap rate for a receive-fixed swaption. Although it is possible to purchase "in the money" swaptions it is not usually rational to do so due to their high cost.

Interest rate swap

An interest rate swap can be constructed as merely a combination of a purchased swaption of one variety with a sold swaption of the opposite variety at the same fixed rate. Effectively, it is the sold receiver swaption that "finances" the purchased pay-fixed swaption. Since they are at the same rate, one party or the other will exercise its swaption in any period, except if the variable rate equals the fixed rate (when it wouldn't matter if payments are made, as they would net to zero). The result is that at for each swap period (which can be many), there will be a two-way payment obligation in which one counterparty always pays the fixed rate and the other always pays the variable rate. This two-way obligation means that, depending on where variable rates are expected to be, the value of each obligation will not be zero; the swap will either be an asset or a liability (its mark-to-market valuation will fluctuate with interest rate movements.)

Figure 2: Diagram of an Interest Rate Swap



Each swap has a fixed-rate payer and a floating-rate payer, and swaps are described as being entered into, not purchased. Thus a borrower will normally enter into a pay-fixed swap with a lender or other bank counterparty, in which it has purchased a pay-fixed swaption and sold an equal and opposite receive-fixed swaption. From the bank's perspective, it has entered into a receive-fixed swap with the borrower.

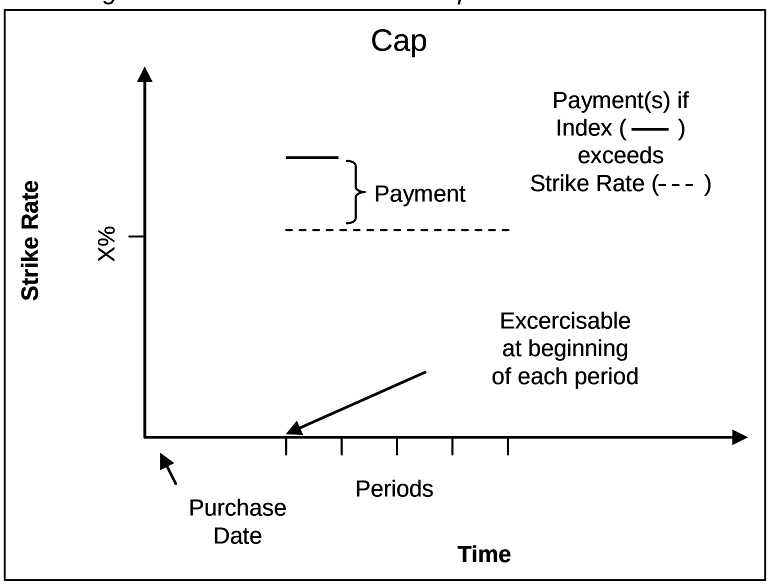
Sometimes this is also referred to as a "reverse swap" but again, it is a matter of perspective. A swap can have a term of a single interest period, or dozens or even hundreds strung together. For a five year swap hedging a loan with quarterly interest payment dates, there will be 20 periods to which the exchange of a fixed rate for a variable rate applies on a standard, or "vanilla," interest rate swap.

Note that a swap is delineated by its effective date – which can be well into the future – and its maturity date. Swaps with an effective date contemporaneous to their trade date are referred to as "spot starting," whereas those with a delay prior to becoming effective are referred to as "forward starting" swaps. And importantly, since the price for each (building block) pay-fixed and receive-fixed swaption will be different based on time to expiration, "at the money" rates for forward starting swaps are likely to be quite different than spot starting swaps.

Interest rate cap

A cap is another combination of swaptions – a neatly wrapped package of sorts. It is a series of successive pay-fixed swaptions, each of a term of one period prescribed by the cap contract, usually designed to match the periodicity of the financing like other common over-the-counter hedge products. When packaged as a single derivative instrument, a cap gives its purchaser the right, but not the obligation, to pay a pre-determined fixed rate (the strike rate, just as in swaptions) if the prevailing variable rate for that period exceeds the strike rate. Exercise of this option is normally done automatically by the cap contract; the purchaser does not normally need to remind its counterparty that the cap is "in the money" for that period.

Figure 3: Diagram of an Interest Rate Cap



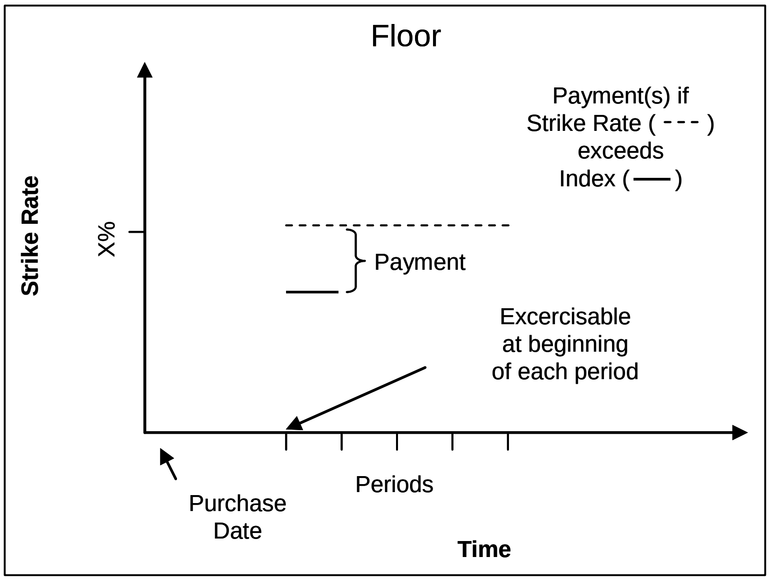
Notably, a cap does not prejudice the purchaser's ability to benefit from lower variable rates in later periods if rates fall. The cap therefore provides ongoing, predictable and flexible protection throughout its term. It cannot become a liability to the purchaser, as it only contains one-way obligations after the premium has been paid. Thus, hedge breakage on a cap can only mean that the purchaser receives a payment on early termination, although sometimes this payment can be negligible or zero (if variable interest rates are well below its strike rate). But the payment of this residual value can be substantial if the opposite is true, especially if plenty of time remains until the cap matures.

For all its advantages, the most negative feature of a cap is its cost; a cap requires an up-front payment for the value of the expected payout given the interest rate environment. Although alternate arrangements can be negotiated to work around the standard up-front nature of the premium (e.g. deferral of the premium until a specified event or future date), the premium itself can sometimes be prohibitively expensive for a borrower. A cap with a strike rate close to the market swap rate over the period of its protection can be quite costly. "Out of the money" caps are those with strike rates well above the market expectations; in exchange for a lower premium, they provide commensurately less protection against rising variable interest rates.

Interest rate floor

The inverse of a cap, a floor is also a purchased series of swaptions. A floor therefore insulates its purchaser from the effects of variable interest rates falling below the prescribed strike rate over the term of the floor contract.

Figure 4: Diagram of an Interest Rate Floor

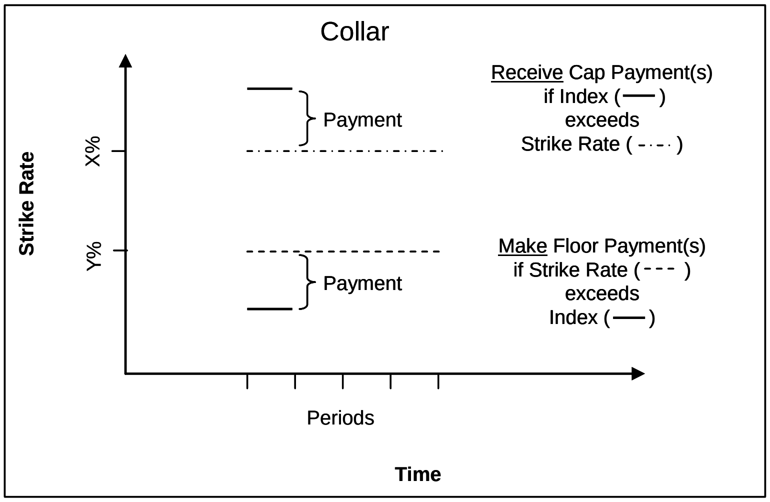


Interest rate collar

A collar is a combination of a cap and a floor. If paying a cap premium is either not palatable or not possible, a borrower can partially or fully offset the premium by selling a floor to the provider of the cap. The resulting package provides protection against variable interest rates above the cap's strike rate whilst forsaking the benefit of interest rates falling below the floor's strike rate.

By entering into a collar, as with a swap, a borrower is entering into a two-way obligation throughout the term of the instrument, since it would need to make a payment in the event that variable interest rates fell below the floor strike rate. Effectively, the only difference between an interest rate collar and an interest rate swap is the fact that the cap strike rate and the floor strike rate are different. A collar with equal cap and floor rates, technically, would be a swap. For this reason, a collar is a very similar hedging instrument to a swap; depending on the width of the "floating band" delineating the variable rates in which no payment is made by either counterparty, these two derivative instruments possess very similar characteristics. Most noteworthy, terminating a collar early can create hedge breakage very similar to that of a swap – although in every instance the magnitude (positive or negative) will be less than a swap, depending again on the width of the floating band.

Figure 5: Diagram of an Interest Rate Collar

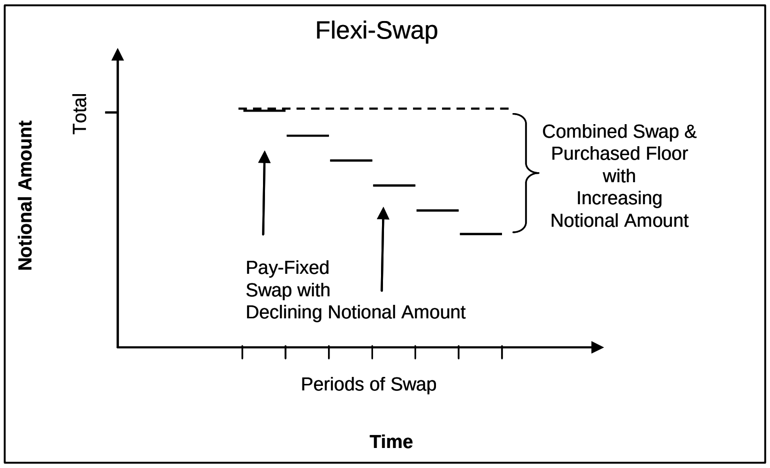


Other combinations

Given the combinations already present in the above descriptions of the most basic interest rate derivatives, one should not be surprised that further combinations are possible. To create the desired blend of protection and flexibility, the basic hedge products can be segmented and/or layered on top of each other. For example, a swap strategy may be appropriate for the first half of a financing, but a cap may be better for the back end. A cap can be purchased so that its effective date is timed to match the chosen termination date of a swap on the front end of a financing. Or, a swap strategy may be well suited for a certain percentage of the debt for its full term; the remaining amount hedged could be "topped up" by a collar, for example.

One combination often favoured by ratings agencies (and by extension, CMBS arrangers) when there may be uncertain prepayment characteristics on a certain portion of the loan is a flexi-swap. This is a combination of at least three derivatives. The first and largest is a standard interest rate swap on a defined portion of the debt for the full term. This is not surprisingly the "swap" part of its namesake. The "flexi" part is derived from a two-part instrument layered onto the swap to provide interest rate protection on the difference between the swap amount and the total hedge amount. Comprised of a standard pay-fixed swap with a purchased series of receive-fixed swaptions (a floor or a version of a floor) at the same strike rate as the swap, this layered portion – and this portion only – is effectively a cancellable swap.

Figure 6: Diagram of an Interest Rate Flexi-Swap



A flexi-swap protects the full amount of the loan balance up to the total hedge amount at a known fixed rate. But if the loan balance is lower than the total hedge amount but above the amount hedged by the standard swap, then the borrower is not subject to hedge breakage on the difference. This difference is shown in the diagram as the area between the total amount (dotted line) and the declining swap amount (solid line stepping down over time). To the extent that the loan balance is less than the amount hedged by the standard swap, the borrower is subject to hedge breakage, however.

Chatham contributed this material first published by Sweet & Maxwell Limited in:

Andrew Petersen, "Commercial Mortgage-Backed Securitisation: Developments in the European Market" 2006, Chapter 6.