Comparing Apples and Oranges (and Pears)

Three hedge strategy alternatives

Ira Kawaller

"By hedging now, companies are assured of protection if rates spike sooner than widely expected, while bearing only minimal cost."

Given the pace of the U.S. economic recovery and the Fed Reserve's stance relating to maintaining low interest rates for an extended period, it's no surprise that many commercial enterprises with variable rate liabilities have remained on the hedging sidelines. By waiting until the interest rate rise is more imminent, however, the opportunity to lock in particularly favorable interest costs could be lost. By hedging now, in advance of a prospective change in sentiment, companies would be assured of protection if rates spike sooner than widely expected, while bearing only minimal cost if the inevitable transition to a higher interest rate environment is more deferred. The cost/benefit from hedging *now* happens to be particularly attractive.

This article examines three alternative hedge contract designs: interest rate swaps, caps, and "swaptions." With swaps, companies can swap their variable interest payments for fixed interest payments, effectively converting a variable interest rate exposure into a synthetic a fixed rate loan. A cap on the other hand, is actually a series of options that serve to put a maximum or ceiling (cap) on the combined interest expense (i.e., traditional interest expenses, coupled with any cap settlements), while at the same time allowing for overall interest costs to fall if interest rates happen to move lower. Swaptions are simply options on swaps. For a premium (i.e., the price of the swaption), the swaption buyer has the right to enter into a swap at some date (as opposed to *now*), if, at that later date, it is opportune to do so.

Swaps are entered into with no initial payment between the parties. Rather, for a fairly priced swap, the fixed interest rate on the swap is set in such a way as to assure that, at the trade date, the sum of the present values of the then-expected future settlements under the swap will equal zero. In contrast, both caps and swaptions require an initial payment by the buyer of the contract. Sometimes, with the swaption, that initial value of the contract can be mitigated by having that cost built into the terms of the swaption, so that the initial cash obligation is still zero. This seemingly zero-cost swaption obscures the fact that this contract involves the purchase of an option, and option purchases require the payment of an option premium. If not made as an upfront payment, this cost would be passed through to the buyer by raising the fixed rate on the swap that results from the exercise of the option.

Three examples

Values for all of these three contract prices are dependent on the yield curve as of the date of the valuation, or more directly, on the configuration of forward interest rates that relate to the interest resets that the hedger is seeking to address. For illustrative purposes, let's assume the objective of evaluating alternative hedge structures on February 7, 2014, with the objective of addressing 12 monthly interest reset exposures tied to one-month LIBOR, say, starting in calendar 2015. Our three choices are (1) a forward-starting interest rate swap, with an effective date of January 2, 2015; (2) a forward starting cap, also with an effective date of January 2, 2015; and (3) a swaption purchased today (February 7) that offers the right to enter a one-year swap, effective January 2,2015.

On the date of the analysis (again, February 7, 2014) the at-market forward starting one-year swap (i.e., the swap having a fair value equal to zero) would have required paying a fixed rate of 0.4420 percent. Thus, by transacting this swap, the hedger could lock

Cost = Notional x Rate Differential x (Days/360) x Discount
Calculating a Swap's "Pay-Up" Cost

Notional	Accural Start	Accural End	Days	Reset Rate	Rate Differenial	Discount	PV
10,000,000	01/02/15	02/02/15	31	0.24295	0.00000	0.99905	$ –
10,000,000	02/02/15	03/02/15	28	0.25481	0.01186	0.99893	92
10,000,000	03/02/15	04/01/15	30	0.28623	0.04328	0.99877	360
10,000,000	04/01/15	05/01/15	30	0.32432	0.08137	0.99860	677
10,000,000	05/01/15	06/01/15	31	0.34062	0.09767	0.99841	840
10,000,000	06/01/15	07/01/15	30	0.38865	0.14570	0.99822	1,212
10,000,000	07/01/15	08/08/15	33	0.44804	0.20509	0.99799	1,876
10,000,000	08/03/15	09/01/15	29	0.47025	0.22730	0.99771	1,827
10,000,000	09/01/15	10/01/15	30	0.53404	0.29109	0.99736	2,419
10,000,000	10/01/15	11/02/15	32	0.60661	0.36366	0.99696	3,223
10,000,000	11/02/15	12/01/15	29	0.63925	0.39630	0.99657	3,181
10,000,000	12/01/15	01/01/15	34	0.72728	0.48503	0.99600	4,563
						Pay-up cost	**20,270**
						Percent of notional	**0.2027%**

in a fixed rate of 0.4420 percent for their funding over the 12 months, starting January 2, 2015—plus any credit spread above or below LIBOR that applied to the original variable rate debt exposure being hedged. (These hedges should be understood to address only the LIBOR component of interest rate expenses.)

Although this forward-starting swap requires no upfront cash payment, it's disingenuous to suggest that it is costless. Certainly, there is an opportunity cost. That is, this contract locks in a rate of 0.4420 percent, such that if market interest rates were lower, the hedging entity would be forced to forego the benefit of these more attractive market rates. Furthermore, we should recognize that this swap requires "paying up" from the current LIBOR of 0.24295 percent, in order to fix our cost of funds. Thus, we can quantify the present value of the incremental difference between paying this 0.4420 percent versus starting LIBOR of 0.24295 percent. We calculate this cost for each accrual period using the equation shown at the top of the accompanying table (corresponding to each row), and we then sum these results to get the aggregate "pay-up" cost.

For illustrative purposes, we perform this exercise assuming a 12-month swap having a start date of January 1, 2015 and a notional size of $10 million. Reset rates shown in the table reflect the forward rate structure as of the trade date (February 7, 2014). The resulting pay-up cost of $20,270, or, equivalently, 0.2027 percent of the notional amount of the swap. If we're ready to pay-up that much for a swap, what would a cap look like that costs that same amount of money?

We should realize that we can construct a cap for any budget. A more expensive cap will protect from a lower threshold interest rate (i.e., a lower strike rate), while a cheaper cap

would protect from a higher threshold (i.e., a higher strike rate). The question is this: If the cost of the cap were set equal to 0.2027 percent of the notional amount, what strike price would that cap have? In this case, the answer is 0.4894 percent. That is, for a premium payment of $20,270, the hedger could assure that the cost of funds in every month will not to exceed 0.4894 percent (exclusive of the credit spread). In some months we may be constrained by this maximum, but in other months we may be able to enjoy the benefit of cheaper funding. In contrast, the swap's resulting fixed rate applies uniformly for all the months during the horizon being hedged.

Just as we were able to design a cap with a specific cost in mind, we can set the cost of a swaption an analogous way. In this instance, we ask what the fixed rate would have to be, in order to be able to buy the swaption for a price equal to 0.2027 percent of the notional. Again, relying on the market conditions on the trade date (February 7, 2014), forcing the swaption price to this premium would permit us to buy the right to exercise into a forward starting swap with a fixed rate of approximately 0.3010 percent. At the end of the 2014 (i.e., when the first reset date is current), this contract would either have value or not: If the spot, one-year swap fixed rate at that time ends up higher than 0.301 percent, this swaption would be in-the-money, otherwise it would expire worthless. An in-the-money swaption as of January 2, 2015 could either be sold or exercised. If exercised, the resulting swap position would then lock in the cost of funds over the coming 12 months at a rate of 0.301 percent (plus the credit spread) for the coming 12 month horizon.

In comparing these three alternatives, it is important to realize that the pay-up cost of the swap is reflected in the swap's fixed interest rate, while the initial premiums for the cap and swaption are not reflected in their respective strike prices. For comparability, we need to add the effect of the starting premiums to the respective critical rates (0.4894 percent for the cap and 0.301 percent for the swaption) to get the anticipated worst case outcomes, inclusive of their initial costs.

Incorporating costs

One way to incorporate these initial costs into our analysis is to appreciate that the present value of an up-front payments (0.2027 percent of the notional for both the cap and the swaption) translates to a step-up in costs from the current LIBOR of 0.24295 percent to the swap's fixed rate of 0.4420 percent—an increase of 0.1991 percent. (The disparity between 0.1991 percent and 0.2027 percent is a consequence of present value versus future value considerations.)

By adding this same 0.1991 percent to the cap's strike rate or the fixed rate of the swaption's underlying forward starting swap, we can generate the effective worst case outcomes of the cap and the swaption, inclusive of their original costs. These adjusted critical rates would then be directly comparable to the 0.4420 percent fixed rate on the swap. For the cap, this all-in worst cast effective cost becomes 0.4894 percent + 0.1991 percent = 0.6885 percent in any given month; for the swaption, the all-in worst case effective cost becomes 0.3010 percent + 0.1991 percent = 0.5001 percent, where the swaption's worst-case fixed rate would apply uniformly over the 12 months being hedged.

At this point, a hedger should be in a position to compare the three alternatives. A rational choice necessarily incorporates some business judgment about the likely course of interest rate movements throughout the hedge horizon. The greater the certainty of rates rising, the greater the likelihood that the swap will be the preferred hedging vehicle. On the other hand, as that certainty is compromised, the appeal of the cap or the swaption will increase, relative to the swap. Perceptions of volatility will influence the choice between the cap and the swaption, as well. An expectation of greater volatility throughout the accrual periods being hedged would favor the cap relative to the swaption, and vice versa.

No single hedge strategy is best for all market scenarios. If the unhedged cost of funds rises above 0.4420 percent during the hedge horizon, the swap would likely turn out to be the best choice. If rates those costs fall between 0.3010 percent and 0.4420 percent, the swaption would likely be the best. If costs fall below 0.3010 percent, the cap would outperform. While hedges should be designed to protect against the risk of an adverse interest rate move, a prudent choice of the hedging instrument should reflect recognition of the fact that the adverse rate change may not occur.

Ira Kawaller is president of Kawaller & Company, LLC, which specializes in assisting corporate entities in their use of derivative instruments. He can be reached at kawaller@kawaller.com.