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Valuation Commentary – February '08

How to Use Credit OAS: An ABS Valuation Case Study for the Illiquid Market

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In a number of *Pipeline* articles and at AD&Co's Annual Conference in June 2007, we introduced the concept of Credit OAS as a sound analytical approach to modeling non-agency MBS. The basic idea is similar to the traditional OAS method, but it revolves around coupled simulations of interest rates and home prices. It also requires the use of a model for defaults and losses (e.g., the LoanDynamics™ Model, LDM), which delivers projected vectors of prepayment, default, loss severity and delinquency rates for every market scenario. These vectors are then submitted to a cashflow generator; the resultant cashflows are discounted using the usual method, but without a credit-inflated spread. The discount spread, which we denote *crOAS*, accounts for liquidity risk, but not for losses, which are now modeled explicitly. The *crOAS* metric levels the playing field among ABS tranches of different supports and credit ratings. In a liquidity nirvana, all ABS tranches are expected to have zero *crOAS* to credit-perfect benchmarks.

Last month we mentioned that an application of the Credit OAS approach may result in a totally different exposure to interest rates from that of the traditional OAS method. We brought up two arguments: A) the loss stream may not necessarily look like an IO nor be equivalent to an inflated discounting, and B) a home price dependence on interest rates may play a key role.

Let us illustrate the application of the Credit OAS method to a case study of the SAS06BC4 subprime deal. The date of this analysis is September 28, 2007, by which the deal had accumulated 5.0% delinquencies and 9.5% severe delinquencies. We analyzed the deal's collateral and 4 tranches, A5, M2, M5 and M8, differing in credit protection. Each tranche's protection had gone up since origination, but this fact points merely to the very low level of already accumulated collateral losses (0.22%). Obviously, fairly large losses are expected to occur in the future given the above mentioned impaired pool composition and falling or stagnated home prices. Actual pricing quotes were available for all tranches; these prices should be viewed with caution, however, because of the illiquid market. Nevertheless, we show how the Credit OAS method can help us analyze the deal from many practical angles.

Valuation Surface

We start by computing the values of the instruments using a *crOAS* of 0. This approach can't lead us to the actual prices because we miss the liquidity spread[1], but it lets us construct a surface of values in the space of 2 tuning factors in our HPA model − the long-term level and the initial level. Generally, for the same values, the long-term HPA tuning factor should be stronger than

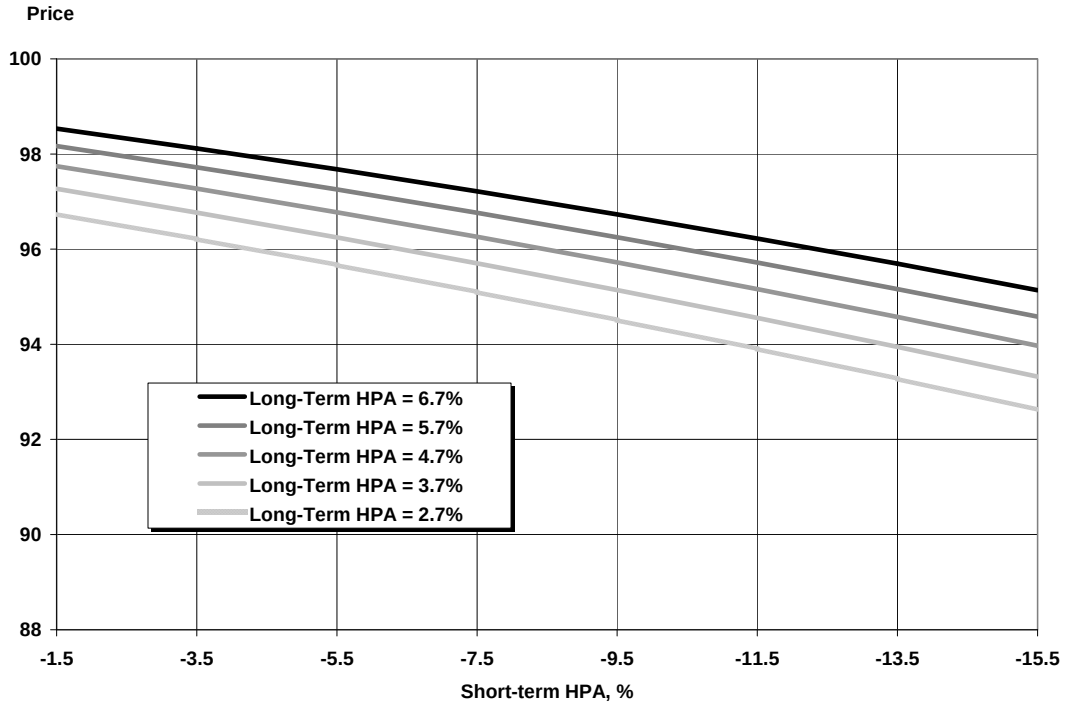
[1] The valuation surface can be constructed for any realistic *crOAS* level.

the short-term HPA because the diffusion term transitions rather quickly in our model. At the same time, the short-term HPA rate is often more uncertain; for example, "balloon-bursting" assumptions made by different analysts and firms varied widely in the fall of 2007.

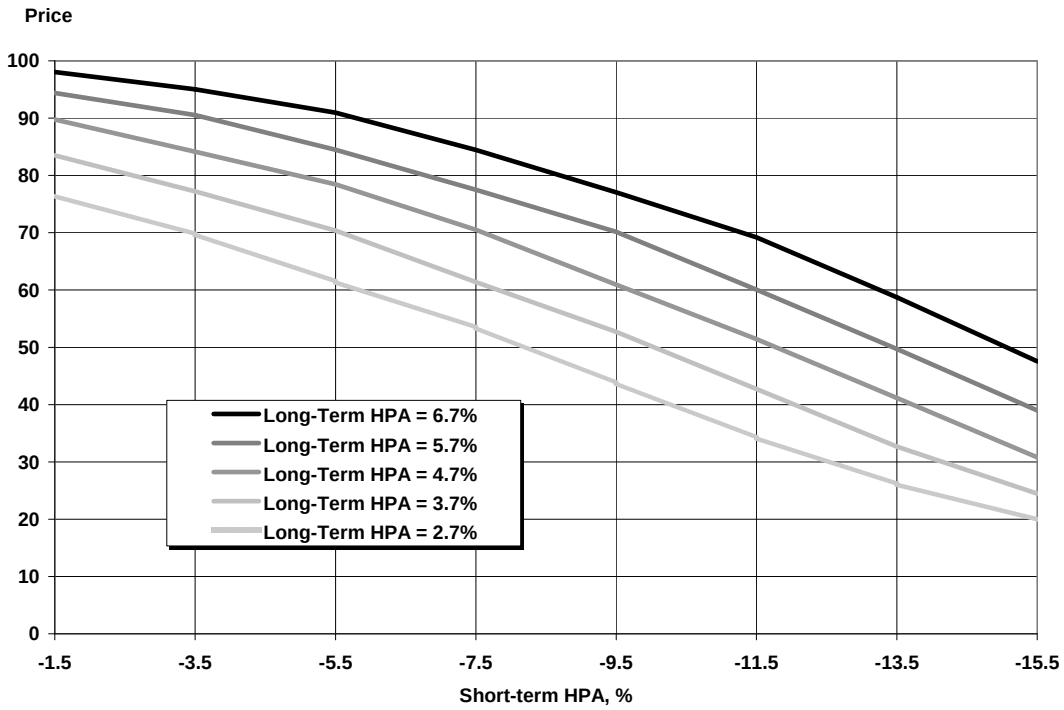
Exhibit 1 depicts zero-*crOAS* prices of the instruments in the space of two HPA tuning factors; to save space, we depict and compare only the collateral and the M8 tranche. As shown, the collateral value changes smoothly and exhibits some negative convexity with respect to each of the HPA factors. This observation agrees with the fact that the borrower's default is an option (a positive convexity might have pointed to a flaw in our model). It also means that, had we resorted to the static valuation method (commonly employed for credit analysis), we would have understated collateral losses. As for the tranche, its value resembles a short position in digital options: negatively convex when the HPA is high (option is out of the money) and positively convex when it is low (option is in the money). This is the direct consequence of a typical credit enhancement within the ABS capital structure. If ABS investors liked to hedge this exposure, they might want to see the CME and ICAP to incept digital home price options.

EXHIBIT 1. Value Surfaces of the SAS06BC4 Deal (Sept. 2007)

A. Collateral



B. The M8 Class



The short-term HPA rate is an instantaneous rate annualized. It is not equal to the 1st-year HPA rate, which is comprised of 63% of the short-term HPA and 37% of the long-term HPA. The 2nd-year HPA is comprised of 23% of the short-term HPA and 77% of the long-term HPA, etc.

Getting to the Right Point

Now, we may try to pinpoint the combination of HPA tunings that best approximates market prices for the M8 – A5 classes. It appears that we can't be successful in performing this calibration exercise. For example, we can easily match depressed prices for the junior tranches (M5, M8), but we don't see a reasonable set of home price tunings to justify pricing quotes for the senior tranches, A5 quoted at 92.265, and M2 quoted at 75.425 - both seem to maintain deeper actual protections than the market quotes indicate. A plausible financial explanation could stem from the liquidity spread. Valuation using *crOAS* is bound to a properly selected, similar liquidity, benchmark. With the illiquid ABS market, we may assume that part of the pricing discount reflects a large bid-ask spread. We therefore decide to use HPA tuning assumptions, 4.7% of the long-term HPA rate, and -11.5% of the short-term HPA rate, that result in reasonable liquidity spreads. The expected loss of collateral is 12.4% in present value given these assumptions. The expected losses for the tranches are shown in Exhibit 2. The rest of the pricing discounts will be absorbed by *crOAS* in recognition of impaired liquidity. We compare main valuation measures using two alternative methods, the traditional OAS method, and the Credit OAS method. To compile the traditional OAS results we ran the same model with a zero loss severity; this step ensures similar total collateral amortization, both voluntary (turnover, refinancing), and involuntary (default) to those in the Credit OAS method.

EXHIBIT 2. Valuation Comparison using Traditional OAS and Credit OAS

Tranche	***Traditional OAS Method***				***Credit OAS Method***			
	Price	*OAS*	*OAD*	*OAC*	*crOAS*	*crOAD*	*crOAC*	*PV(loss)*
A5	92.265	312	0.7	0.1	254	1.6	-0.7	0
M2	75.425	737	2.1	0.4	511	7.8	-5.0	2.1
M5	65.443	876	3.3	0.6	378	20.9	-9.8	17.3
M8	37.126	2,030	3.8	1.6	480	47.9	7.0	57.6

The levels of *crOAS* look wide, but plausible, for the illiquid market (A5 has better liquidity). The most stunning difference between the two methods is the projected interest rate sensitivity. A duration of 50 years sounds scary and is unlikely to be proven by daily prices. It is merely a result of the strong relationship between interest rates and home prices in our HPA equation. On the other hand, the results agree, in principle, with the notion of lowering interest rates as a recipe to curtail the credit crisis. Whatever the true OAD can be, our analysis suggests it can vary widely with a particular HPA model and is unlikely to stay close to the traditional measure.