

## Valuation Commentary

### Agency MBS and AD&Co. Models during the Subprime Turmoil

By Alex Levin

In 1998 the financial world was stressed by a series of crises. Most notable, the Russian default in that August, triggered a chain reaction causing a number of large funds (like LTCM) to collapse, their counter-parties realized losses and everyone sought a safe harbor – U.S. Treasuries. All “spread products” cheapened drastically and, even on an LOAS basis, MBS widened to as much as 50 bps. LOAS for the current-coupon TBA came back down to 20 bps in about 3 months and in 3 more months, returned to its long-term normal range (-20 bps to +10 bps) where it had remained most of the time. I documented these dynamics in Fabozzi’s *Professional Perspectives on Fixed Income Portfolio Management* (2001).

One lesson we learned is that the agency-backed products can cheapen in the absence of an adequate cause directly related to the credit of that GSE. Another lesson is that LOAS levels are strongly mean reverting and tend to return to their long-term equilibriums. Under stress, market prices are not martingales and some mark-to-market losses are recoverable. In a good review of recent events, “Re-evaluating Valuation” (*Risk*, August 2007), Jayne Jung attributes losses occurred at Bear Stearns Asset Management (BSAM) to inability to meet margin calls, collateral seizure and its subsequent sales at a large discount that pushed prices further down. Bear Stearns stopped the process by a large cash injection.

Let us return however to my primary themes: Why would a credit crisis affect benign agency MBS? Does the AD&Co agency model adequately reflect recent market changes?

Several explanations for agency MBS cheapening exist:

1. Demand/supply imbalance – existing investors are forced to sell MBS assets to raise cash, meet margin calls, and maintain liquidity. Potential investors don’t have cash and face high cost of borrowing.
2. Psychological effect that impairs liquidity – MBS are relatively complex fixed income instruments. Investors (especially, foreign) tend to avoid assets they don’t know well - even if they are not “those” mortgages.
3. Modelers naturally like to keep their models under all circumstances, but they have to carefully revisit assumptions such as housing mobility, loan origination standards and home price appreciation, since they influence prepayments and may not hold in a stressed economy. Hence, some cheapening or richening can be illusive.

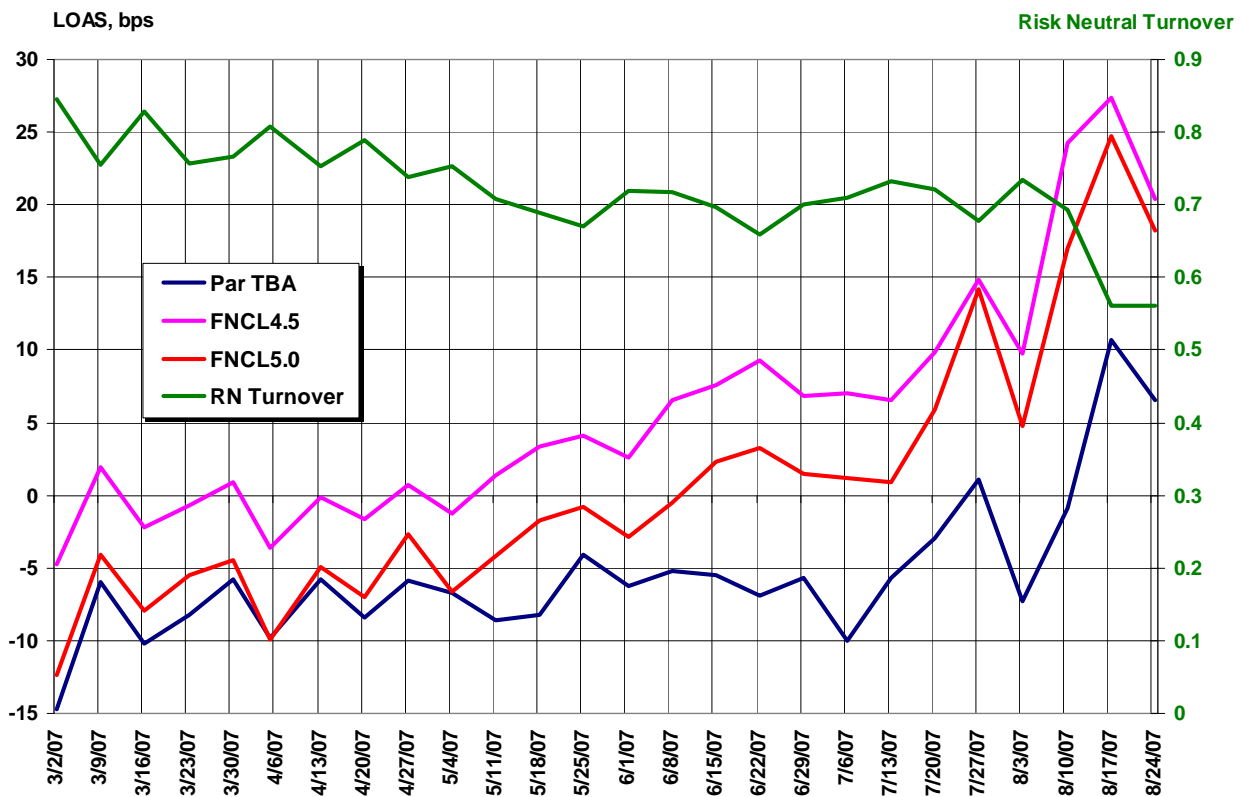
None of these reasons relate to GSE credit. In fact, the AD&Co. OAS model shows us that government TBAs are slightly cheaper than conventionals. The rest of the article contains analyses of major agency MBS sectors up to August 24, 2007.

### Fixed-Rate TBAs

Exhibit 1 depicts the dynamics of the current-coupon (blue) LOAS over the last 6 months using AD&Co. the OAS system V7.2. On the same graph we show LOAS for two discount TBAs: FNCL 4.5 (pink) and FNCL 5.0 (red). On the right axis, we plot the risk-neutral turnover tuning over the same historical interval (green).

The turnover tuning, normally in the 0.75 – 0.90 range, has recently fallen below 0.6. Discount TBAs widened relative to the current coupon, particularly over the last 3 months. These changes can't be explained by interest rates because they are the same now as they were 3 months ago. Finally, the current coupon has widened 15 bps or so just in the month of August.

**Exhibit 1. Libor OAS and Risk-Neutral Turnover**



These dynamics of risk-neutral turnover and discount MBS LOAS induce a strong suspicion that the market trades MBS to a lower turnover than the one underpinning the AD&Co agency prepay model. Indeed, our model predicts 128 PSA for FNCL4.5 and 184 PSA for FNCL5.0. Bloomberg's medians are 123 PSA and 145 PSA, respectively, and dealers' LOAS medians are 7 – 10 bps tighter for these coupons<sup>1</sup>. The Trust IO/PO market confirms this discrepancy as well (see last section of this article).

<sup>1</sup> AD&Co. compilation.

As Dan Szakallas and Sanjeeban Chatterjee point out in the [Prepayment Update](#) in this issue of *The Pipeline*, the AD&Co. prepay model performance report does not confirm a sizable deterioration as of yet. However, the downslide of the existing home sales index coupled with pessimistic views on home price appreciation (those I personally don't share) and tightening origination guidelines make it plausible to think that the MBS market makers have slowed the turnover assumptions.

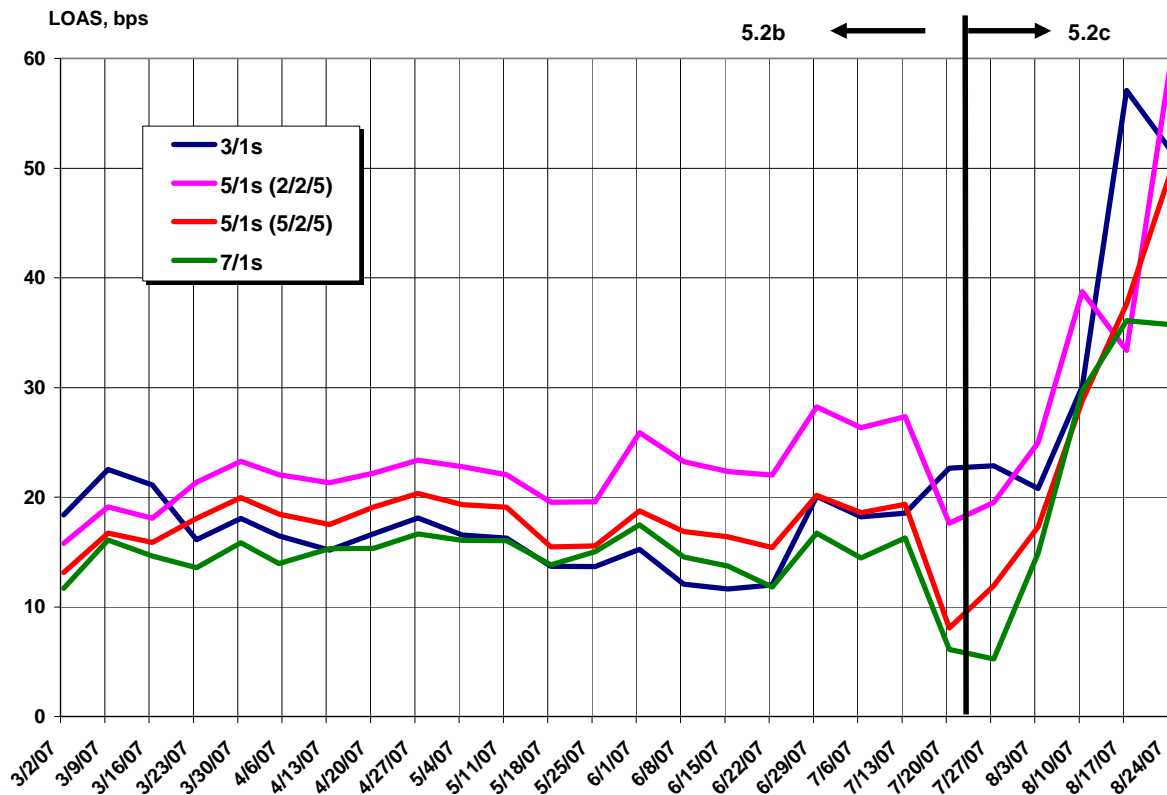
In order to shed even more light into the TBA market and to attribute the recent changes, let us note that the risk-neutral turnover has dropped 20% in August and 30% since March (Exhibit 1). How would AD&Co's LOAS levels have changed had we slowed the turnover in our physical prepay model? To estimate the effect, let us account for the "turnover duration" reported in our Market Analysis Report: about 0.4 for FNCL4.5, about 0.3 for FNCL5.0, and 0.06 – 0.10 for the current coupon. These are price sensitivities to a 10% change in turnover. Multiplied by the actual change they explain a 0.8 point value loss of FNCL4.5 in August (1.2 points since March) resulting in a seeming 13 bps LOAS widening (20 bps from March). For FNCL5.0, the LOAS should have widened by 10 bps in August (15 bps since March). Finally, for the current coupon, this would explain the 3 to 5 bps of widening in August (5 to 8 bps since March).

We conclude that the anticipated turnover slowdown is responsible for a sizable portion of the TBA cheapening. Adding to this the slight swap tightening to agencies, we think that the liquidity impairment for TBAs is only 4 – 7 bps. It is nowhere close to the 1998 events in magnitude.

### **Hybrid ARMs**

If housing mobility is expected to get slower, it should make most hybrids more attractive – shouldn't it? However, prices for new agency hybrids have recently dropped. Exhibit 2 depicts the LOAS story, for the par-priced hybrids.

## Exhibit 2. Recent history of LOAS for par-priced hybrids



What can cause such a dramatic turn of events? The switch from 5.2b prepay model to 5.2c has actually reduced the LOAS as the new model is faster and more conservative, from the ARM's valuation stand-point.

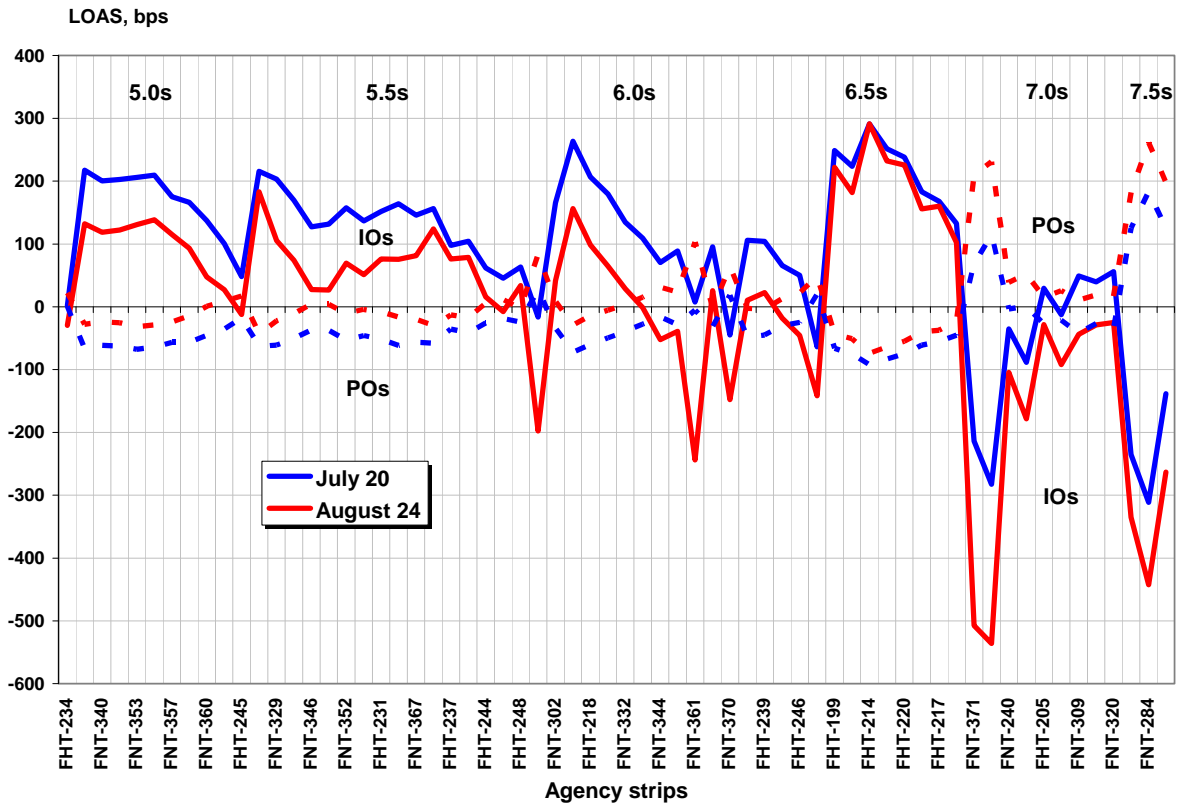
The main reason for such drastic widening is the change in demand/supply balance of hybrids. These instruments, traditionally held by banks and REITs for their own portfolios, are being sold to meet margin calls and liquidity improvements (Thornburg alone sold \$20B). Kenneth Schmidt, the portfolio manager of Bank Hapoalim attests, "We have seen a dramatic widening across all mortgage sectors given the current market disruption, largely driven by forced selling from leveraged investors." Another investor, Neil Powers of Vectors Research Management, says of ARMs, "Numerous traditional mortgage investors, including hedge funds have gone out of business or have been forced to liquidate positions; there is currently limited capital to put to work. These assets lack sponsorship."

The current market situation has created a particular skew in investment interests that is somewhat model-related. ARM investors can't afford negative or modest carry anymore. They want to pay a price that ensures a solid return without reliance on the ARM's tail. Exhibit 2 indirectly supports this view: 3/1s (large tail) widened more than 7/1s (small tail). Furthermore, discounts widened more than premiums (FN7s have actually tightened for 5/1s and 7/1s).

## The Trust IO/PO Market

Exhibit 3 proves that the IOs (solid lines) tightened and POs (broken lines) widened recently. This observation is perfectly inline with the above discussion of the turnover factor.

**Exhibit 3. Recent Dynamics of the Trust IO/PO Market**



For an IO, each percent of CPR is equivalent to 1% of discounting. Therefore, some of the 100 bps of tightening can be properly attributed to a 1.0 CPR reduction, which is not far from the expected turnover slow-down.

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To summarize this review of the current agency MBS market, we attribute the observed TBA widening more to the expectation of a slower housing turnover than to technical factors. It is confirmed by the recent IO/PO shift as well. For agency hybrids, the market technicality is the leading force that features an impaired liquidity, high supply, and investor appetite for carry without reliance of the tail's value. The hybrids look truly cheap. Learning from the past, we expect all these anomalies and imbalances to revert to normal market conditions.



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