Market Focus

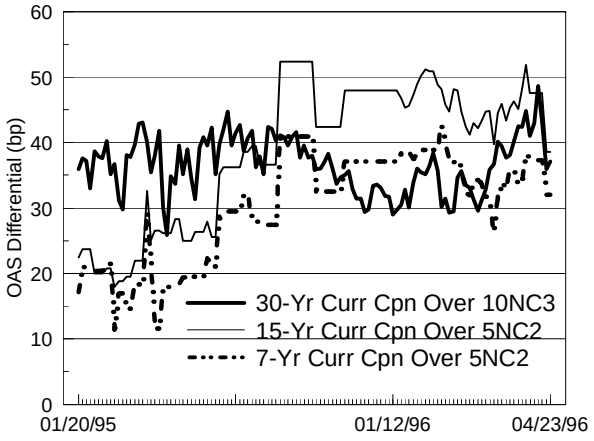
The Spread Differential: Mortgages and Agency Debentures

Ever since the radical slowdown in REMIC issuance two years ago, the presence of FNMA and FHLMC as large buyers of mortgage securities and, in turn, issuers of debentures has been a dominant phenomenon affecting the relative supply and demand in the MBS marketplace. Like the agencies, we monitor the relationship between MBS spreads and benchmark callable agency debenture spreads to help us assess relative values in the mortgage market. We also track increases in the size of FNMA's and FHLMC's retained portfolios as they relate to the higher spread differential between mortgage assets and debentures. In this article, we begin to explain the spread differential between mortgages and debentures and try to articulate what affects this spread differential. In addition, we have calculated a number of break-even sensitivities to refinancing efficiency and volatility. Currently, the spread between mortgages and agency debentures seems to be very close to its 1995-96 average. This helps to confirm our continued neutral stance on the mortgage market and is consistent with our latest view of mortgage-Treasury spreads, which is described in the *Mortgage Market Comment* of April 4 ("Time to Reduce Your Mortgage Exposure to Neutral").

The OAS differential between conventional 30-year MBS current coupons and a 10-year debenture callable after three years (the thickest line in the graph below) has moved between 30 and 50 bp over the past year-and-a-half, and now stands close to its average level. The OAS differentials between current coupon 15-year and seven-year MBSs versus five-year, non-call two, agency debentures are also close to historical average levels. The current 35 bp higher spreads on mortgages can be partially explained by:

- Uncertainty of borrowers' prepayment behavior
- Effect of longer-dated and shorter-dated volatility on performance
- Greater difficulty in hedging mortgages

Conventional MBS Spreads Are Now at Average Levels Over Debentures



So, while mortgages do offer higher spreads than comparable debentures, there are some important reasons that affect investor preferences which help to support the current spread differentials. It should be noted that in the graph at right and throughout this analysis, we have adjusted the OAS for debentures to account for the richness of the on-the-run Treasury securities from which they are generally benchmarked. This makes the OAS comparison between MBSs and debentures a fair exercise by putting them both on an even footing--*spreading them both over the off-the-run yield curve*. In addition, options for both MBSs and debentures are valued using a common volatility assumption of 15%.

As stated, the spread differentials of MBSs and callable debentures can be partially explained by the differences in refinancing efficiency, by the differences in ability to hedge the cash flows, and by the way volatility affects the two sectors. We can place a bound on the differential by looking across these dimensions to estimate the necessary change required in any one of these to help to explain the entire spread differential. In fact, it is far

more likely that smaller changes in all of these factors (and probably some small fixed spread component) would explain the mortgage/debenture spread differential.

Refinancing Efficiency

Clearly, FHLMC and FNMA as a pair of large single-sector-minded institutions with an articulated business strategy to grow their mortgage portfolios and carefully manage the asset/liability risk will be able to more efficiently exercise the call options embedded in their liabilities than would a group of diverse homeowners with disparate interests. However, we can try to measure how much more efficient refinancing in the mortgage market would have to be for spreads to be comparable to those in the debenture market.

The OAS differential between the two markets overstates the relative value of MBSs because it reflects, in part, a risk premium. This risk premium compensates an investor for the uncertainty about the mortgage borrowers' call decision, i.e., prepayment, in response to interest rates and other factors. As history has shown, there is a fair amount of uncertainty about the magnitude of their response. Past behavior is no guarantee of future behavior owing to the impact of new or changing factors that influence prepayments. This uncertainty is not captured in the OAS framework, which uses a single certain prepayment model. As a result, the OAS reflects a risk premium that is being priced into the mortgage to offset the adverse impact from such unexpected changes in prepayment behavior. In contrast, very little uncertainty exists about the call behavior of the agencies: They will exercise their debenture call option consistently across time and interest rate and economic scenarios.

Gauging the relative magnitude of the prepayment uncertainty risk premium is obviously not an exact science. However, we can put some dimensions on the risk premium indirectly by backing out the prepayment model that would reduce the MBS OAS to that of a callable agency. This “market” implied prepayment model would embody the break-even prepayment risk that is currently being priced into the market. We can then examine this implied prepayment model for reasonableness. A simplified approach is to focus on a single risk factor, ignoring other variables that affect prepayments. For example, we can adjust the cusp sensitivities of our prepayment model to give conventional 7.5s the 18 bp OAS of 10 NC 3 agencies. This would require cusp shocks of six times our standard definition to reduce the OAS of conventional 7.5s to that of the callable debentures. To put this into perspective, this would imply that refinancing incentives would immediately need to increase by 150 bp for any given level of Treasury rates. In essence, this translates into lenders originating loans at a negative cost. Certainly origination costs are declining and will in effect increase the cusp sensitivity; but a more likely scenario is that the impact of declining costs would be equivalent to about two to three cusp shocks.

This analysis leaves out unanticipated changes in other factors that would affect the OAS of a mortgage, such as an increase in "peak" levels of prepayments, or the reduction of burnout as the agencies start using housing price indexes to replace on-site housing appraisals. Both of these factors would reduce the OAS of a mortgage. For example, we can take the extreme case of creating a prepayment model without burnout and with a peak prepayment rate of 100% SMM after a 100 bp decline in the mortgage rate. In this case, conventional 7.5s would have a -25 bp OAS.

The Impact of Volatility

Volatility has a slightly different effect on the mortgage and debenture sectors. FNMA and FHLMC closely monitor longer-dated callable swap volatility when issuing 10 NC 3 or 5 NC 2 paper. They use the longer-dated callable swap market to help tailor their liability exposure, to create the appropriate duration, and to lower their funding cost. On the other hand, in theory, the volatility on longer-dated callable swaps should also have an impact on the mortgage market. In practice, however, investors who are buyers of mortgages, but who want to hedge out their option risk, would find it too expensive to do this in the longer-dated swaption markets. Instead, they are more likely to hedge in the shorter-dated

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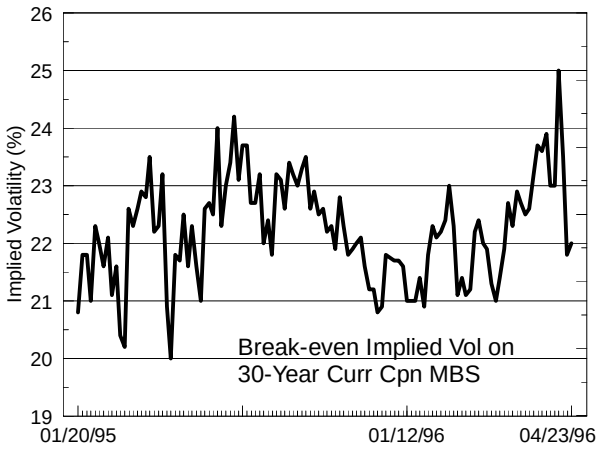
options markets. Recently, we have observed longer-dated swaption volatility drift significantly lower by two to three percentage points, while shorter-dated (three-month) volatility on 10-year Treasuries is only marginally lower. This differential "calendar" effect of volatility on mortgage/debenture performance is an important one. Recently, agency debentures have remained fair to the extent that swaption volatility has dropped and agency implied volatilities have tracked this move (see *Agency Market Update*, April 1996).

MBSs Represent a Sale of Options at Higher Implied Volatilities Than Debentures And Swaptions



If we follow on the theme that buyers of MBSs are actually selling options that are exercised less efficiently than those embedded in callable debentures, then a natural question is to determine the implied volatilities of the options that have been sold. To that end, we have calculated the implied short-rate volatility that equates the OAS on current coupon 30-year conventionals to that of 10 NC 3 debentures (assuming their OAS was calculated at a 15% volatility). In the graph at right, it is quite apparent that for MBSs, the lack of homeowner refinancings as efficient as agency calls represents a sale of options at higher implied volatilities than either debentures or longer dated swaption volatility, albeit with the increased uncertainties as described above.

Summary

In summary, the spread differential between mortgages and callable debentures compensates investors for the lower refinancing efficiency of MBSs, higher uncertainty of actual MBS prepayments, differential sensitivity to changes in volatility, and the difficulty in hedging mortgage-backed securities. After the tightening over the last few weeks, the MBS/debenture spread is about at its 1995-96 average level.