Update to the Primary-Secondary Spread Model

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On December 9, 2012, we added a new primary-secondary (P-S) spread model to the mortgage calculator, available for use through the model preference page. At the close of business on Friday, January 11, 2013, this P-S spread model will become the default P-S model used with the beta prepayment model V1.23 *(Agency Prepayment model update: Modeling capacity constraints*, October 19, 2012). At the close of business on Friday, February 8, 2013, the updated beta prepayment model (i.e., the beta prepayment model V1.23 and the new P-S spread model) will be rolled out to production.

We define the P-S spread as the difference between the zero-point mortgage survey rate and the theoretical par-coupon rate on MBS. Historically, we have used a combination of 2y and 10y swap rates and a par-coupon based rate attractiveness variable to estimate the P-S spread. As swap rates rally, the P-S spread increases and the steepness of the increase is driven by the relative attractiveness of the par-coupon. In this update to the model, we plan to replace swap rates with par-coupon.

The key difference between the models is that the new model explicitly accounts for changes in the mortgage basis (i.e., changes to par-coupon not explained by swap rate movements). For most of the sample dataset used for this model (January 2000 to the present) changes in the mortgage basis are very highly correlated with changes in swap rates so there was less of a need to explicitly account for them in the P-S spread model. For example, when rates rally, prepayment fears and risk generally increase, widening the mortgage basis. Over the past few quarters, however, the mortgage basis has been driven more by changing views on the Fed MBS purchase program and so is less correlated with swap rates.

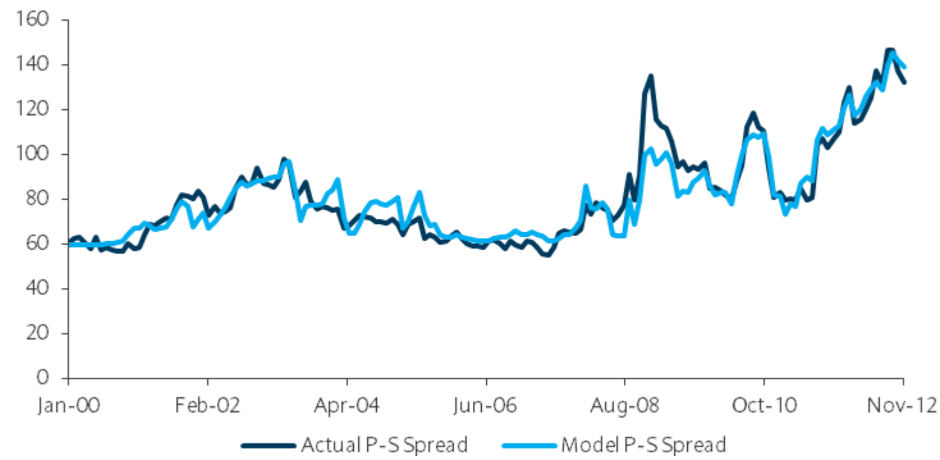
In this environment, we find that the par-coupon fits the historical P-S spread better than swap rates. The one notable exception is the late-2008 early-2009 time period when swap rates rallied significantly more than par coupon (i.e., the mortgage basis widened) but the P-S spread still widened dramatically. However, that was also a period of extraordinary uncertainty coinciding with the introduction of HARP. Overall, the updated P-S spread model using par-coupon does a better job of fitting all of the historical data than the prior version. Apart from fitting the historical data better (Figure 1), using the par-coupon instead of swap rates to project the P-S spread has two key advantages:

- When only the 2y and 10y swap rates are used to calculate the P-S spread, the partial duration of these points on the curve are understated relative to others points. Partial durations are calculated by shocking specific points on the curve. So when the 10y point on the curve is shocked up or down by 5bp, mortgages rates move by much less than that because the production model P-S spread is driven by 10y swap rates, thereby decreasing the price impact and the partial duration on the 10y. Conversely, when, for example, the 5y point is shocked it has no effect on the P-S spread, thereby increasing the price impact and the partial duration on the 5y. The par coupon, on the other hand, is calculated by using the entire forward curve; so a shock to any point on the curve will affect the par-coupon and, in the new model, the P-S spread also.

- In addition to mortgage rate duration, we now calculate par-coupon duration that takes into account changes to the P-S spread. Mortgage rate duration is calculated by shocking mortgage rates directly, while par-coupon duration is calculated by shocking the par-coupon. In both cases swap rates and discounting remain unchanged. In the new P-S spread model when par-coupon is shocked up and down 5bp mortgage rates move by less than that because the P-S spread model is now based on the par-coupon. The mortgage rate duration continues to reflect the full shock to mortgage rates.

FIGURE 1

Model versus actual P-S spread



Source: HSH, Barclays Research

As noted above, the P-S spread is measured as the difference between the zero-point mortgage survey rate and the theoretical par-coupon rate on MBS. So changes to GSE guarantee fee (g-fee) directly affects the P-S spread. This is captured in the constant term of the P-S spread model:

P-S Spread = F (Par-Coupon, Rate Attractiveness variable) + Constant

Apart from the g-fee, the constant term also includes minimum servicing and origination costs that are passed on to borrowers either in their rate or in points paid. Prior to 2012, this term was approximately 60bp. In 2012, it increased by 20bp to account for the two 10bp g-fee increases announced by FHFA1. There have been many indications by FHFA that they might choose to increase g-fees further in the future. The model does not assume any increases; however, users can impose their views on future g-fee increases in the model preference page.

Overall, the new P-S spread model is projecting a P-S spread that is about 10bp lower than the P-S spread currently used by the beta prepayment model V1.23. Thus, rolling to the new P-S spread model will decrease mortgage rates used in the beta model by about 10bp.

[1] One of 10bp increases in g-fee is scheduled to sunset in January 2022. Consequently, when projecting the P-S spread we assume that the constant term declines to 70bp at that time.

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