



Interpreting tradable implications and qualifications

Our model is based on a regression of high-LTV and loan balance pay-ups on a small set of variables:

- *Refinance incentive*: measured as the gross WAC on the TBA deliverable for a given period less the prevailing mortgage rate. This variable captures the price premium in the corresponding TBA, increased prepay risk in the TBA, and changes in the fair value of the dollar roll. As refi incentive increases, so too should pay-up value
- *Cumulative refinance incentive*: Measures how long a given TBA cohort has been exposed to refi incentive. This variable captures borrower burnout and will interact with the impact of refi incentive. For higher levels of cumulative refi incentive, increases in refi incentive will have less of an impact on pay-up value as prepay sensitivity in the TBA is diminished
- *Month-over month change in primary rate*: Measures the momentum and persistence of rate moves and can also change the impact of refi incentive. Pay-up values should change with a lag to sudden rate moves, as the new level will need to be sustained to translate into a real change in prepays.

In addition to the core set of variables used in the loan balance model, we also found that a measure of national home price appreciation provided additional explanatory power for CQ pools. For that measure we simply used the year-over-year percentage change in the S&P Case-Shiller 20-city home price index. Interestingly, that measure did not improve explanatory ability for CR pools, and is not included in that model. That difference seems reasonable given the minimum 105 LTV on CQ pools versus the 125 LTV minimum on CR pools—home price appreciation is much less likely to spring CR borrowers from negative equity in the near term.

The high-LTV model is a strong fit, explaining nearly 97% of observed variance, similar to the loan balance model. Using these models, loan balance 4.5%*s* look undervalued, while CR pools look overvalued. For instance, in LLB 4.5%*s* the difference between actual pay-up and model pay-up suggests that the story is undervalued by \$2-04+.

Of course, the model obviously does not fit perfectly—in fact, looking at the historical model predicted value versus actual shows a standard deviation of the error of \$0-08. However, in the case of the LLB 4.5%*s*, the current difference of \$2-04+ is 8.4 times the error standard deviation. Similarly, the actual pay-up on CR 4.5%*s* is \$0-22 higher than the model value, which is 2.3 times the standard deviation of the error.

Constructing a model of high-LTV pay-ups

The most interesting aspect of this exercise is again that the relationship between refi incentive and pay-up is not linear in high-LTV pools, but instead is curved (Figure 8).