Securitized Products Modeling

# Agency fixed rate prepayment model update - Beta V1.37

**After the close of business on Friday, November 20, 2015, we will introduce a new Beta agency fixed rate prepayment model on Barclays Live. It can be accessed by setting the "FR Model Version" to Beta (V1.37) in the Preferences tab on the mortgage calculator.**

## We summarize the key changes in the latest model release

- **Updated conventional and GNMA models**
  The latest model release builds on the previous model version V1.36.4. The primary changes in model version V1.37 include higher turnover, separate LTV and TPO effects for purchase and refinance loans, lower prepayments on New York pools, and revised projections for GNMA Refi Plus (ie, FHA MHA) and RHS pools.

- **New primary-secondary spread model**
  In this model release, we are introducing a new primary-secondary spread model, PSS V2.0. This is a function of historical par coupon rates and time effects corresponding to g-fee increases and certain LLPA increases. Unlike prior versions, the new primary-secondary spread model has no dependence on the absolute level of the par coupon rate, only its level relative to past values. The new model fits empirical mortgage rate data much better than the previous version.

- **Expanded model servicer effects and knobs**
  One of the key changes in the new model version is an expanded set of servicer effects for the 30 largest servicers, compared with effects for just five servicers in previous versions. The servicer-specific effects include refinance multipliers, elbow shifts and, for GNMA collateral, delinquency buyout rate multipliers. We are also introducing user knobs for the 30 modeled servicers. These allow users to create their own servicer-specific refinance multipliers, elbow shifts, refinance incentive lags, and buyout rate multipliers.

- **Incorporation of new LLPA matrix**
  On April 17, 2015, the FHFA announced that it had directed the GSEs to make several adjustments to their loan-level pricing adjustments for mortgages purchased on or after September 1, 2015. The changes include removal of the 25bp upfront adverse market delivery charge for most mortgages. Changes to the LLPA matrix effectively leave the delivery charge unchanged for higher FICO, lower LTV borrowers. In addition, they increased the up-front fees charged on loans with other risk-layering attributes (cash-out refinances, investment properties, loans with secondary financing, and jumbo conforming loans). Overall, the LLPA changes were relatively limited in scale. Consequently, the prepayment changes after incorporating these changes are relatively small.

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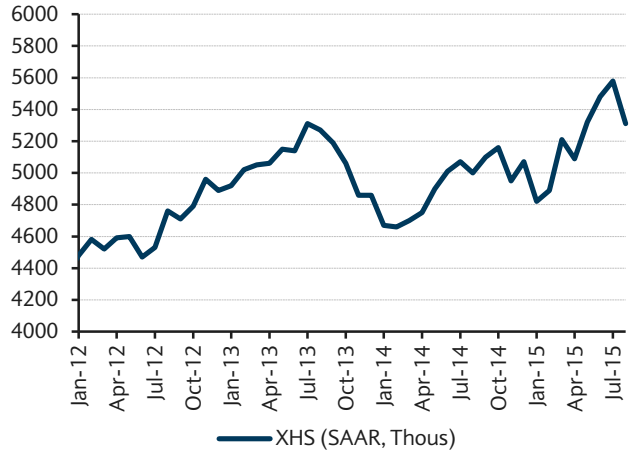
FIGURE 1
**Existing home sales have increased sharply y/y**




Source: NAR, Barclays Research

FIGURE 2
**Model projections for lower coupons**

| | Model v1.36.4 | | | | Model v1.37 | | | |
|---|---|---|---|---|---|---|---|---|
| Cohort | 1m | 3m | 6m | 12m | 1m | 3m | 6m | 12m |
| FN 2.5 13 | 5.3 | 5.5 | 5.9 | 5.2 | 5.8 | 5.9 | 6.4 | 5.6 |
| FN 2.5 12 | 5.6 | 5.8 | 6.2 | 5.5 | 6.1 | 6.2 | 6.8 | 6.0 |
| FN 3 13 | 6.6 | 6.8 | 7.4 | 6.5 | 7.2 | 7.3 | 8.1 | 7.1 |
| FN 3 12 | 6.9 | 7.0 | 7.7 | 6.9 | 7.4 | 7.6 | 8.4 | 7.6 |
| | Model Error | | | | Model Error | | | |
| FN 2.5 13 | -0.1 | -0.2 | -0.3 | 0.1 | 0.3 | 0.2 | 0.1 | 0.5 |
| FN 2.5 12 | -0.1 | 0.0 | -0.4 | -0.1 | 0.4 | 0.4 | 0.2 | 0.4 |
| FN 3 13 | -0.9 | -1.0 | -1.2 | -0.8 | -0.4 | -0.5 | -0.5 | -0.1 |
| FN 3 12 | -0.9 | -1.0 | -1.1 | -0.8 | -0.4 | -0.5 | -0.4 | -0.2 |

Note: November prepayment report. Source: Fannie Mae, Barclays Research

## Updates to the conventional and GNMA model

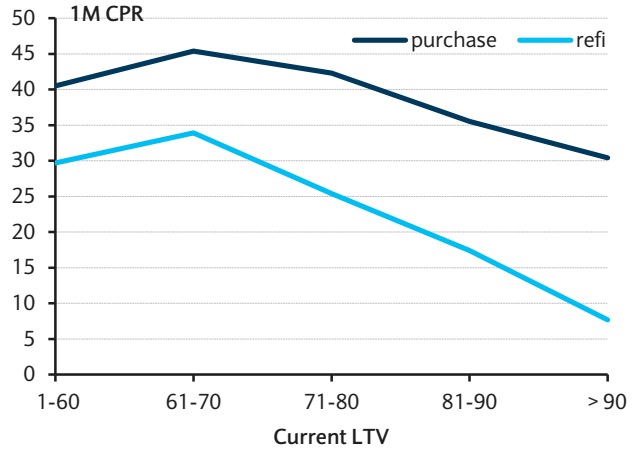
As part of the release of model version 1.37, we are adjusting model projections based on prepayment data received since the previous update, V1.36.4. In addition, we are making selected improvements to the structure of the agency prepayment model where needed. While the latest release contains many small adjustments, we summarize the main changes below. A full breakdown of model projections and the OAS effect can be found in the Appendix.

### *Increase in model turnover*

The performance of the previous model (V1.36.4) on lower coupons contains errors (ie, model minus actual prepay rate) of 0.5-1.5 CPR over the past six months. It appears that several factors are accounting for this discrepancy. First, existing home sales have increased 10% y/y, leading to higher turnover (Figure 1). Second, the existing model primary-secondary spread has been too high, thereby overestimating model lock-in for lower coupons. And finally, V1.36.4 does not capture the increased incentive that high LTV borrowers with private mortgage insurance (PMI) have when home price appreciation reduces their updated LTVs below 80. Among lower coupon cohorts, 10-20% of borrowers have PMI and original LTV>80. Empirically, prepayments for these borrowers can be 3-4 CPR higher than for comparable WAC borrowers with no PMI.

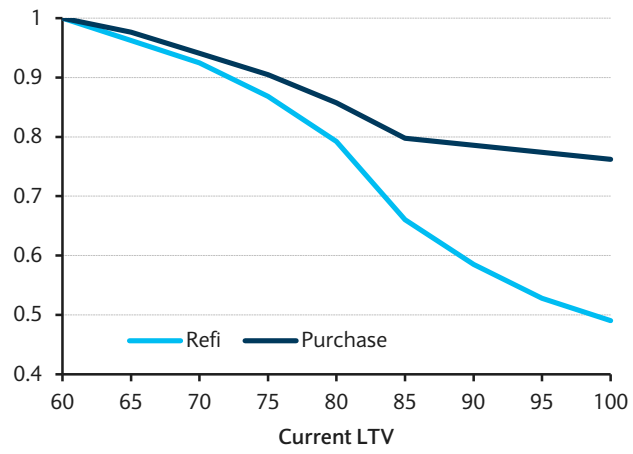
The new model corrects for these discrepancies as follows. First, we increase base model turnover to reflect higher home sales in the current environment. This represents a change in direction from previous model versions, where base turnover was decreased. Version V1.37 also incorporates a new primary-secondary spread model. At current rate levels, the primary-secondary spread – and, hence, mortgage rates – is lower under the new model, resulting in less lock-in and higher turnover. Figure 2 shows model projections and errors for model versions V1.36.4 and V1.37.

FIGURE 3
**Prepayments by LTV and loan purpose**




Note: FH loan-level data18-30 WALA, 200K+ loan size, 50-100bp ITM, January-June 2015 sample period. Source: Freddie Mac

FIGURE 4
**Post-HARP model refinance multipliers by updated LTV**




Source: Barclays Research

*Adjusted the LTV effect by loan purpose*

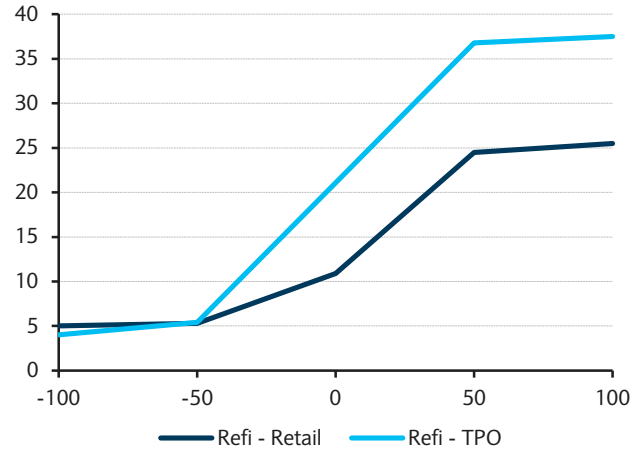
Empirically, there are sharp differences in the prepayments of new production high LTV collateral based on loan purpose. High LTV purchase loans when in the money have had relatively high prepayments (Figure 3). Much of this is due to the fact that these borrowers have undergone a full underwriting process, demonstrating their ability to qualify for a refinance under today's stricter underwriting guidelines, and accrete additional incentive to refinance as their homes appreciate in value because of the possibility of lowering or eliminating their mortgage insurance premium. In contrast, high LTV refinance loans have continued to exhibit strong call protection. The bulk of these borrowers refinanced through the HARP program, which has very limited underwriting requirements, based only on recent pay history and verbal verification of employment. They have not demonstrated the ability to qualify under a full underwriting process. Furthermore, many of them would have to get additional mortgage insurance to refinance outside of the HARP program (borrowers can refinance through HARP only once), further dampening their economic incentive.

Model version V1.37 captures these prepayment differences by introducing separate LTV-based refinance multipliers for purchase and refinance loans. This allows the model to maintain lower prepayments for new production MHA/CQ pools while producing higher prepayments on high LTV purchase pools. Figure 4 illustrates the sensitivity of the new model's refinance function to updated LTV and loan purpose.

*Refined TPO effect*

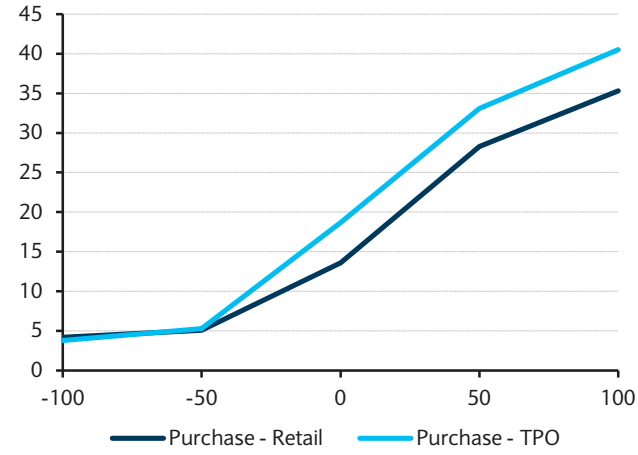
Model version V1.36.4 contains effects that account for the higher rate sensitivity of loans that have gone through a third-party origination channel. The magnitude of the TPO effect in V1.36.4 differs by loan age (it is most pronounced for loans that are 6-18 WALA) and TPO channel (broker vs. correspondent). Model version V1.37 builds on these features by expanding the origination channel effects to also differ by loan purpose (purchase vs. refinance).

FIGURE 5
**TPO effect appears strong for refi loans …**




Source: Freddie Mac, note: 6-24 WALA refi loans, 200K+loan size, Jan-June 15 sample period

FIGURE 6
**…while being limited for purchase**




Source: Freddie Mac, note: 6-24 WALA purchase loans, 200K+loan size, Jan-June 15 sample period

One of the explanations for the higher prepayments of broker and correspondent loans is that these borrowers tend to respond very aggressively to solicitation offers for lower rates. Many of them have refinanced several times with the same broker and respond to very small changes in rates. From a predictive standpoint, borrowers who have refinanced through a TPO channel are more likely to be serial refinancers. In contrast, the use of a TPO channel for the purchase of a home provides a less pronounced empirical signal about a borrower's refinancing behavior.

Figures 5 and 6 illustrate this point using loan-level data on mortgages guaranteed by Freddie Mac. Figure 5 shows a substantial TPO effect for refinance loans, while Figure 6 suggests a much more diminished effect for purchase loans. Thus, the empirical evidence is consistent with the intuition that TPO effects are largely limited to refinance loans. We capture this in V1.37 by adding distinct broker/refinance, correspondent/refinance, broker/purchase, and correspondent/purchase effects in the model. This maintains the traditional TPO effect for refinance loans along with a much more limited TPO effect for pools with high concentrations of purchase borrowers.

### *Weaker FICO effect*

Recent prepayments for lower FICO collateral (ie, FICO<700) have been higher than expected (Figure 7). Credit scores affect prepayments in the model in several ways. They affect borrower mortgage rates through LLPAs. They also affect the level of roll rates in the CDR model. However, their principal influence is on the level of refinancing activity predicted by the model. Higher-than-expected prepayments on lower FICO pools suggest that credit scores are less of a barrier to refinancing than assumed in the model. To adjust for this, the effect of FICO on refinancing activity has been reduced in model version V1.37.

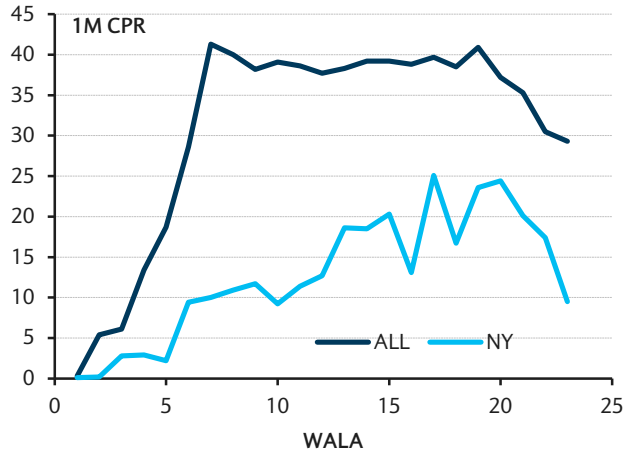
In addition to weakening the generic FICO effect, we have also adjusted the FICO effects for specific products. For example, conforming jumbo collateral has shown relatively modest refinancing impairment due to borrower FICO. Rather, the fact that they are jumbo borrowers seems to be a stronger credit signal than their credit score. We have therefore further reduced the effect of FICO on the refinancing sensitivity of jumbo collateral in V1.37.

FIGURE 7
**FICO effects have been weakened in the new model**

| < 700 FICO | Model v1.36.4 | | | | Model v1.37 | | | |
|---|---|---|---|---|---|---|---|---|
| pools | 1m | 3m | 6m | 12m | 1m | 3m | 6m | 12m |
| FN 3.5 13 | 9.4 | 9.5 | 10.1 | 9.1 | 11.3 | 11.1 | 12.1 | 10.9 |
| FN 3.5 12 | 10.1 | 10.3 | 11.0 | 10.1 | 12.1 | 11.8 | 13.2 | 12.1 |
| FN 4 13 | 12.6 | 12.3 | 13.9 | 13.2 | 16.2 | 15.5 | 17.8 | 16.7 |
| FN 4 12 | 12.7 | 12.8 | 13.9 | 13.0 | 16.2 | 15.8 | 17.6 | 16.8 |
| FN 4.5 13 | 16.1 | 15.6 | 17.6 | 17.2 | 19.9 | 19.4 | 22.0 | 21.2 |
| FN 4.5 11 | 15.2 | 15.2 | 16.6 | 15.9 | 18.9 | 18.7 | 20.7 | 19.9 |
| FN 5 13 | 17.5 | 17.2 | 19.0 | 18.5 | 19.5 | 19.4 | 21.5 | 20.8 |
| | Model Error | | | | Model Error | | | |
| FN 3.5 13 | -2.5 | -2.0 | -2.6 | -2.4 | -0.6 | -0.4 | -0.6 | -0.6 |
| FN 3.5 12 | -0.9 | -0.9 | -1.7 | -1.5 | 1.1 | 0.7 | 0.5 | 0.6 |
| FN 4 13 | -3.3 | -3.3 | -2.7 | -3.0 | 0.3 | 0.0 | 1.2 | 0.5 |
| FN 4 12 | -2.4 | -2.0 | -2.7 | -2.5 | 1.0 | 1.0 | 1.1 | 1.3 |
| FN 4.5 13 | -4.9 | -4.1 | -3.6 | -4.4 | -1.1 | -0.3 | 0.8 | -0.4 |
| FN 4.5 11 | -1.4 | -1.7 | -1.0 | -1.2 | 2.4 | 1.7 | 3.0 | 2.8 |
| FN 5 13 | -2.2 | -0.9 | -1.4 | -3.8 | -0.2 | 1.3 | 1.1 | -1.5 |

Note: November prepayment report. Source: Fannie Mae, Barclays Research

FIGURE 8
**TPO effect is limited in New York loans**




Note: New York and All loans, 50+ bp ITM, 250K+ loan size, January 2012-September 2015 sample period. Source: Freddie Mac, Barclays Research

*Reduced prepayments for New York state pools*

Prepayments on New York pools have been reduced in V1.37 to be more in line with empirical data. Despite higher–than-average loan sizes on New York pools, prepayments have continually fallen below projections. Prepayments for New York state pools are slow, for several reasons. From a refinancing perspective, a mortgage recording tax of 1-2% presents a significant obstacle to refinancing. While technically this can be avoided by assigning the loan to a new lender, the costs and time involved make it a significant impediment to refinancing. Furthermore, New York pools have lower–than-average turnover rates, in response to higher-than-average transaction costs.

This is captured in V1.37 as follows. First, refinance-related prepayments for New York pools have been slowed by an additional 10% relative to V1.36.4. We have also dampened the TPO effect for New York pools in V1.37. Empirically, New York pools display little TPO effect, likely due to the mortgage recording tax and difficulties in performing loan assignment to a new originator. Prepayments and errors under the new model are shown in Figure 9.

*Increased model burnout*

As mortgage rates rallied in the early part of the year, there was a pickup in overall refinancing activity. However, seasoned vintages did not display the acceleration in prepayments that was expected by model V1.36.4. This subdued refinancing response for seasoned vintages suggests that these cohorts are more burned out than implied by the model. We have therefore strengthened the burnout effect in V1.37 to better replicate the data.

*Updated relo model*

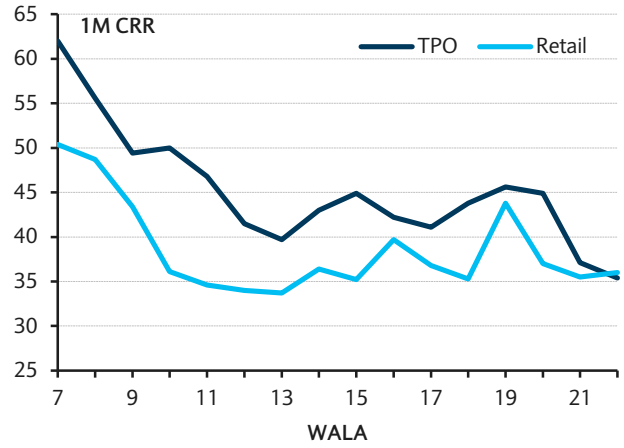
Projections for relocation mortgages have been updated in the latest model as well. In particular, we have increased the amount of seasonality in turnover-related prepayments on relo collateral.

FIGURE 9
**New York state pools in the new model**

| NY pools | Model v1.36.4 | | | | Model v1.37 | | | |
|---|---|---|---|---|---|---|---|---|
| | 1m | 3m | 6m | 12m | 1m | 3m | 6m | 12m |
| FN 3 13 | 4.6 | 4.6 | 5.0 | 4.5 | 4.9 | 5.0 | 5.5 | 4.9 |
| FN 3.5 13 | 6.1 | 6.2 | 6.7 | 6.0 | 6.7 | 6.8 | 7.3 | 6.7 |
| FN 4 14 | 10.8 | 9.7 | 12.1 | 12.3 | 8.0 | 7.3 | 8.2 | 7.6 |
| FN 4 13 | 11.4 | 10.6 | 13.3 | 13.9 | 10.9 | 10.3 | 12.9 | 12.6 |
| FN 4 12 | 8.4 | 8.4 | 9.5 | 9.1 | 8.8 | 8.9 | 10.0 | 9.6 |
| FN 4.5 09 | 16.5 | 15.7 | 19.1 | 19.2 | 14.3 | 13.7 | 16.6 | 16.6 |
| | Model Error | | | | Model Error | | | |
| FN 3 13 | -0.7 | -1.0 | -0.3 | 0.2 | -0.3 | -0.6 | 0.1 | 0.5 |
| FN 3.5 13 | -1.8 | -1.1 | -0.2 | -0.1 | -1.2 | -0.5 | 0.4 | 0.5 |
| FN 4 14 | 6.1 | 5.6 | 6.4 | 5.9 | 3.3 | 3.1 | 2.5 | 1.2 |
| FN 4 13 | 1.7 | 1.5 | 1.9 | 3.5 | 1.3 | 1.3 | 1.6 | 2.2 |
| FN 4 12 | -5.4 | -2.4 | -0.5 | 0.2 | -5.0 | -1.9 | 0.0 | 0.7 |
| FN 4.5 09 | 1.0 | 0.8 | 1.9 | 2.5 | -1.3 | -1.1 | -0.6 | -0.1 |

Note: November prepayment report. Source: Fannie Mae, Barclays Research

FIGURE 10
**FHA loans exhibit a distinct TPO effect**




Note: FHA loans, 130-140 MIP, balance >=200k, 50-100bp ITM, January-June 2015 sample period. Source: Ginnie Mae loan level data

## Key changes to the GNMA model

Below, we highlight some of the key changes in the GNMA model. A full breakdown of model projections and the OAS effect can be found in the Appendix.

### *WALA-based FHA effect (TPO proxy)*

Following the reduction of the FHA mortgage insurance premium in January 2015, there was a significant uptick in GNMA prepayments. Another prevalent effect was a TPO effect for FHA prepayments. As we show in Figure 10, a distinct TPO effect is visible for FHA loans following the MIP decrease in early 2015.

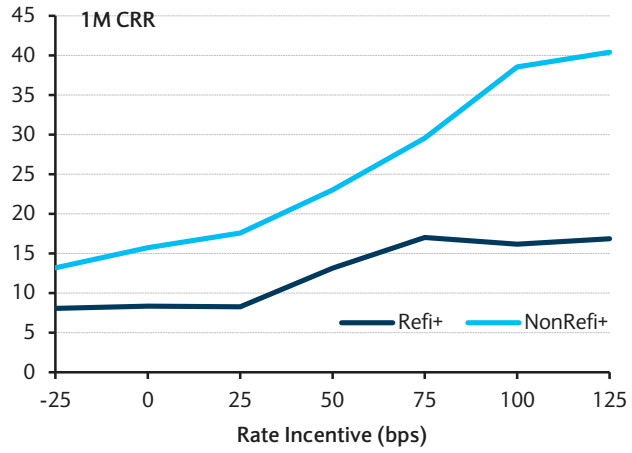
TPO disclosures are relatively new in the GNMA sector. As a consequence, we have historically not included TPO effects for GNMA collateral in our models. In V1.36, however, we added a proxy TPO effect for VA collateral, but did not extend this to FHA mortgages at the time. Given the new data, we are adding a WALA-based TPO effect for FHA collateral.

### *New implementation of the FHA to conventional refinancing effect*

One of the key changes on the GNMA side of the model is a new implementation of the FHA to conventional refinancing effect. In V1.36.4 this effect is captured in the rate incentive used. The model looks at the additional rate incentive a borrower has for an FHA-to-conventional refinance and adds a portion of this to his or her FHA-to-FHA rate incentive based on the pool FICO and updated LTV. While this approach works well, there are some shortcomings, the biggest of which is that this tends to underestimate incremental FHA-to-conventional prepayments for lower coupon cohorts. The reason is that prepayments for cuspy coupons are highly non-linear and incentive-based adjustments underestimate the average effect on prepayments across incentive buckets.

To correct for this, V1.37 uses a prepayment-based methodology. Specifically, instead of adding a portion of the additional refinancing incentive to the overall rate incentive, the new approach adds a portion of the refinancing SMM for an FHA-to-conventional refinance to the total refinancing SMM. In addition to being a more intuitive way to capture the conventional mortgage opportunities faced by FHA borrowers, this implementation does a better job of fitting the prepayments of lower coupon cohorts.

FIGURE 11
**FHA Refi plus pools have been slow**




Note: FHA loans, 2013 origination, April-September 2015 sample period. We identify Refi+ loans as 55bp running MIP loans with a 1bp upfront MIP.
Source: Ginnie Mae loan-level data

FIGURE 12
**Refi plus prepayments in model V1.36.4 and V1.37**

| REFI+ | Model v1.36.4 CRR | | Model v1.37 CRR | |
|---|---|---|---|---|
| Cohort | 6m | 12m | 6m | 12m |
| GN 3.5 13 | 11.8 | 9.7 | 8.4 | 7.0 |
| G2 3.5 13 | 12.4 | 10.1 | 7.5 | 6.3 |
| G2 4 14 | 8.9 | 6.6 | 5.8 | 4.4 |
| G2 4 13 | 14.0 | 11.5 | 10.2 | 8.4 |
| G2 4 12 | 17.4 | 14.8 | 12.1 | 10.0 |
| G2 4.5 14 | 12.0 | 8.9 | 9.5 | 7.1 |
| | | | | |
| GN 3.5 13 | 2.3 | 1.9 | -1.1 | -0.8 |
| G2 3.5 13 | 3.5 | 2.8 | -1.5 | -1.0 |
| G2 4 14 | 1.9 | 1.3 | -1.1 | -0.5 |
| G2 4 13 | 3.8 | 3.4 | 0.0 | 0.3 |
| G2 4 12 | 5.4 | 4.7 | 0.1 | -0.1 |
| G2 4.5 14 | 4.9 | 2.4 | 2.5 | 0.8 |

Note: November prepayment report. Source: Ginnie Mae, Barclays Research

*Slower refi plus pool prepayments*

Another change in the new model is slower prepayments on 55bp MIP FHA streamlined refinancing pools (refi plus). Even after adjusting for rate incentive, refi plus pools tend to prepay slower than other FHA loans (Figure 11).

To capture this behavior, we have flattened the refinancing response for refi plus pools. Figure 12 shows model projections and errors for model versions V1.36.4 and V1.37.

*Faster prepayments on RHS pools*

Model V1.37 makes some targeted adjustments to improve model accuracy on RHS cohorts. Model errors on V1.36.4 reveal that prepayments on rural housing pools have exceeded model estimates. Although it is difficult to say exactly why this is occurring, there are some possible explanations. For example, the rural housing service has introduced a new streamlined refinancing pilot program. It is possible that this has boosted refinancing in what has traditionally been a purchase program.

To align model projections with empirical prepayments, we have made several changes. For one, we have increased the refinancing and turnover multipliers for RHS loans. Even with the changes, however, projected voluntary prepayments on RHS loans are still well below other GNMA loan types.

In addition to the above changes to voluntary prepayments, we reduced the dependence of RHS roll rates on SATO. Unlike most other collateral types, RHS loan delinquencies show much weaker correlation with SATO. Figure 13 shows model projections and errors for V1.36.4 and V1.37.

*Targeted adjustments to MJM collateral*

In the latest model version, we have made some targeted adjustments to bring MJM (GNMA conforming jumbo) pool projections more in line with empirical data. Generally, we have increased prepayments in newer vintage cohorts, while bringing down prepayments in more seasoned cohorts that have experienced more burnout. In addition, we have reduced the FICO sensitivity of MJM collateral. GNMA jumbo collateral has less sensitivity to FICO than standard pools. Figure 14 shows model projections and errors on MJM collateral for model versions V1.36.4 and V1.37.

FIGURE 13
**RHS pool projections versus actuals**

| RHS+ Cohort | Model v1.36.4 | | | | Model v1.37 | | | |
|---|---|---|---|---|---|---|---|---|
| | CRR | | Roll Rate | | CRR | | Roll Rate | |
| | 6m | 12m | 6m | 12m | 6m | 12m | 6m | 12m |
| G2 3 12 | 3.3 | 2.9 | 2.7 | 2.8 | 4.3 | 3.6 | 2.7 | 2.8 |
| G2 3.5 12 | 4.3 | 3.8 | 2.7 | 2.7 | 5.7 | 5.0 | 2.7 | 2.8 |
| G2 4 12 | 4.8 | 4.3 | 3.4 | 3.4 | 6.7 | 6.0 | 3.2 | 3.2 |
| GN 4 10 | 6.6 | 6.1 | 5.8 | 5.9 | 10.1 | 9.4 | 5.9 | 5.9 |
| G2 4.5 11 | 8.3 | 7.9 | 5.9 | 5.9 | 12.2 | 11.7 | 5.5 | 5.5 |
| GN 5 10 | 10.2 | 9.7 | 7.7 | 7.9 | 14.1 | 13.4 | 6.1 | 6.2 |
| | Model Error | | | | Model Error | | | |
| G2 3 12 | -4.1 | -3.0 | -0.1 | -1.2 | -3.1 | -2.3 | -0.1 | -1.2 |
| G2 3.5 12 | -3.6 | -2.5 | -0.7 | -0.9 | -2.2 | -1.4 | -0.7 | -0.8 |
| G2 4 12 | -4.1 | -2.6 | -1.5 | -1.7 | -2.1 | -0.9 | -1.6 | -1.9 |
| GN 4 10 | -3.8 | -2.9 | 1.3 | 1.3 | -0.4 | 0.4 | 1.3 | 1.4 |
| G2 4.5 11 | -3.5 | -2.4 | 2.2 | 2.2 | 0.4 | 1.4 | 1.8 | 1.8 |
| GN 5 10 | -4.3 | -2.3 | 2.6 | 3.3 | -0.3 | 1.3 | 1.0 | 1.6 |

Note: November prepayment report. Source: Ginnie Mae, Barclays Research

FIGURE 14
**GNMA MJM pool projections versus actuals**

| MJM Cohort | Model v1.36.4 CRR | | | | Model v1.37 CRR | | | |
|---|---|---|---|---|---|---|---|---|
| | 1m | 3m | 6m | 12m | 1m | 3m | 6m | 12m |
| G2 3 12 | 20.0 | 19.6 | 22.9 | 20.4 | 17.8 | 17.4 | 20.3 | 20.1 |
| G2 3.5 13 | 26.6 | 26.4 | 31.1 | 29.9 | 22.5 | 22.7 | 29.0 | 31.3 |
| G2 3.5 12 | 25.9 | 25.5 | 28.7 | 26.1 | 20.3 | 20.4 | 23.4 | 23.0 |
| G2 4 13 | 42.3 | 43.9 | 50.2 | 48.7 | 45.0 | 46.6 | 55.8 | 59.0 |
| G2 4 10 | 32.5 | 31.3 | 36.5 | 32.2 | 30.5 | 29.7 | 34.4 | 34.2 |
| G2 4.5 11 | 40.8 | 40.9 | 43.7 | 40.7 | 31.2 | 31.1 | 34.6 | 33.8 |
| | Model Error | | | | Model Error | | | |
| G2 3 12 | 3.9 | 4.3 | 6.6 | 2.7 | 1.7 | 2.1 | 4.0 | 2.5 |
| G2 3.5 13 | 7.2 | 4.6 | 5.0 | -0.2 | 3.0 | 0.9 | 2.9 | 1.2 |
| G2 3.5 12 | 1.0 | 3.7 | 5.0 | 1.7 | -4.6 | -1.4 | -0.2 | -1.4 |
| G2 4 13 | -4.9 | -9.3 | -3.6 | -11.4 | -2.2 | -6.6 | 1.9 | -1.1 |
| G2 4 10 | 6.4 | 4.0 | 3.0 | -0.5 | 4.4 | 2.4 | 0.8 | 1.5 |
| G2 4.5 11 | 17.2 | 8.4 | 8.6 | 7.7 | 7.7 | -1.3 | -0.5 | 0.8 |

Note: November prepayment report. Source: Ginnie Mae, Barclays Research

## New Primary-secondary spread model

As part of the new model release, we are incorporating a new primary-secondary spread model. Following the rally in rates in the beginning of the year, we began to observe a persistent error in the primary-secondary spread model, PSS V1.4 projections versus actuals (Figure 15). As a result, we have released a new model version, PSS V2.0, to reflect recent dynamics in mortgage rates better. PSS V2.0 is the default primary-secondary spread model for prepayment model V1.37.

Relative to PSS V1.4, the new model version has a revised functional form. The new primary-secondary spread model is composed of two main components; a rate attractiveness effect and g-fee time effects. In addition to the previous factors, PSS V1.4 also has a dependency on the absolute level of current coupon that is absent in the new model. Below, we show a simple illustration of the new model specification.

Primary secondary spread = f (rate attractiveness) + g-fee time effects

### *Rate attractiveness is a key driver in the model*

Within the new PS spread model, rate attractiveness is the primary driver. This is defined as a weighted average of the relative attractiveness – in terms of the monthly payment on a newly originated 30-year mortgage – of the current 30-year par coupon rate vs. past values of the 30-year par coupon rate. The look-back period for the calculation is five years. Historically, rate attractiveness has been a good proxy for the level of refinancing activity and, consequently, has been an effective predictor of variation in the primary-secondary spread. Figure 16 illustrates how the primary-secondary spread varies with different levels of rate attractiveness in PSS V2.0 (inclusive of post-crisis g-fee increases).

### *G-fee adjustments also play a significant role*

Running G-fee changes and loan level pricing adjustments from the GSEs have also influenced mortgage rates during the past few years. Increases in g-fees raise the spread above current coupon that originators need to charge borrowers, resulting in higher primary-secondary spreads and, hence, higher primary market mortgage rates. While the previous model incorporated a rate add-on for two running g-fee increases implemented in

2012, the new model also makes adjustments for specific LLPA changes that increased the up-front delivery fees on high FICO mortgages with LTV<=80 (ie, the mortgages typically represented in survey mortgage rates).

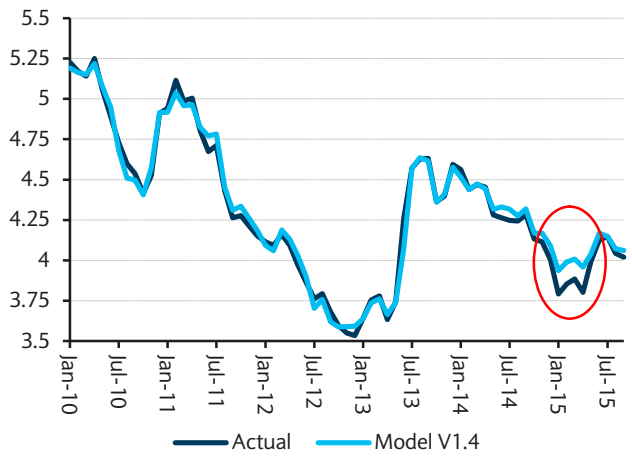
*Examining New Model performance*

Figure 17 shows the historical fit of projected mortgage rates under PSS V2.0 versus actual rates. Generally, the new model fits the historical data much better than PSS V1.4 or PSS V1.0. This is particularly true for late 2014 to the present, when PSS V2.0 tends to track actual mortgage rates quite well.

Figure 18 illustrates key differences between PSS V1.4 and V2.0 using a scenario analysis that shows the predicted primary-secondary spread immediately after an instantaneous shift in par coupon, one year after an instantaneous shift in par coupon with no subsequent change, and five or more years after an instantaneous shift in par coupon with no subsequent change. One key difference is that PSS V2.0 has a noticeably flatter primary-secondary spread function than PSS V1.4, implying that mortgage rates move more closely with changes in par coupon than in PSS V1.4. Also, in PSS V2.0, after five years the primary-secondary spread reverts to a long-run

FIGURE 15

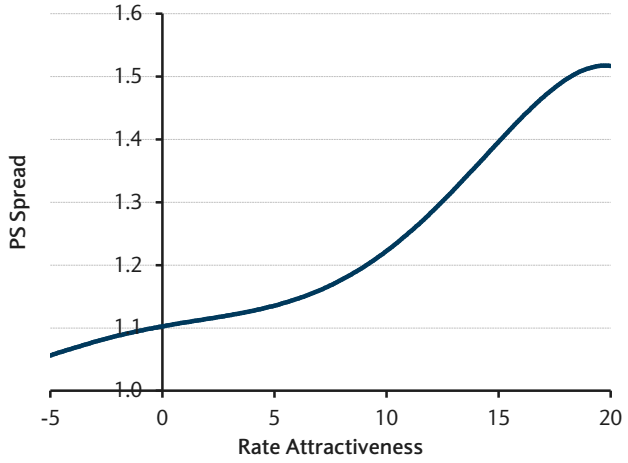
**Mortgage rates have diverged recently under PS model V1.4**




Note: no point mortgage rate. Source: Freddie Mac, Barclays Research

FIGURE 16

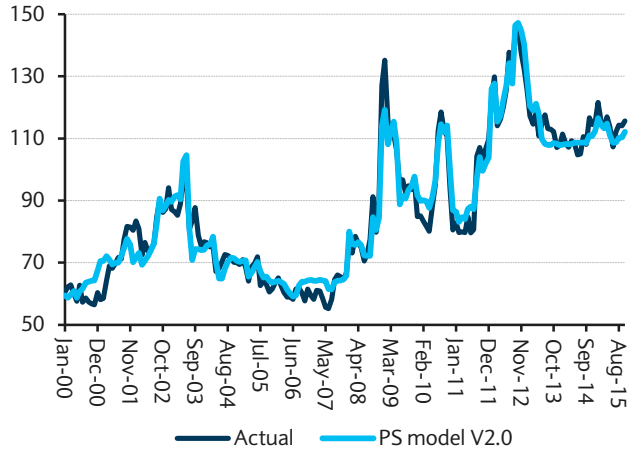
**PS model 2.0 PS spread versus rate attractiveness**




Source: Barclays Research

FIGURE 17

**PS Model V2.0 primary secondary spread versus actual**




Source: Freddie Mac, Barclays Research

FIGURE 18

**Projected PS spreads under various scenarios (V2.0 vs. V1.4)**

| | PS model V1.4 | | | PS model V2.0 | | |
|---|---|---|---|---|---|---|
| CC Rate | Instant | 1 Year | Long Term | Instant | 1 Year | Long Term |
| 2.00 | 1.61 | 1.45 | 1.24 | 1.29 | 1.19 | 1.09 |
| 2.25 | 1.55 | 1.40 | 1.22 | 1.20 | 1.17 | 1.09 |
| 2.50 | 1.44 | 1.32 | 1.21 | 1.16 | 1.14 | 1.09 |
| 2.75 | 1.28 | 1.24 | 1.19 | 1.12 | 1.12 | 1.09 |
| 3.00 | 1.12 | 1.18 | 1.18 | 1.09 | 1.09 | 1.09 |
| 3.25 | 1.07 | 1.10 | 1.16 | 1.07 | 1.08 | 1.09 |
| 3.50 | 1.05 | 1.06 | 1.15 | 1.05 | 1.07 | 1.09 |
| 3.75 | 1.04 | 1.05 | 1.13 | 1.04 | 1.05 | 1.09 |
| 4.00 | 1.03 | 1.03 | 1.12 | 1.03 | 1.04 | 1.09 |

Source: Barclays Research

equilibrium value at zero rate attractiveness. In PSS V1.4, after five years the primary-secondary spread reverts to a long-run equilibrium that depends on the absolute level of par coupon. Thus, V2.0 embeds the assumption that the volume of refinancing activity will eventually normalize around prevailing rates if they remain unchanged.

### *Valuations appear less favourable under PS spread model 2.0*

Mortgage rates produced by PSS V2.0 are generally lower than those produced by PSS V1.4. Furthermore, the difference between the two increases as rates fall. One consequence of this is that the call risk produced by the new primary-secondary spread model is greater. As a result, model valuations for pass-through MBS and IOS are lower.

Figure 19 shows the valuation effect of primary-secondary spread model changes. The table shows OAS, OAD, and projected CPRs for prepayment model V1.36.4 (which uses PSS V1.4 by default), prepayment model V1.37 using PSS V1.4, and prepayment model V1.37 (which uses PSS V2.0 by default). The change in primary-secondary spread has a material effect on model OAS for IOS under prepayment model V1.37. For example, for lower coupon IOS, OAS falls 65-100bp due to the change in the primary-secondary spread model (ie, when comparing V1.37/PSS V1.4 to V1.37/PSS V2.0). Comparing V1.37/PSS V2.0 to V1.36.4/PSS V1.4, one sees that the combined effect of the prepay model and primary-secondary spread model changes is even greater, with OAS on lower coupon IOS falling 120-150bp. This is because the effect of lower mortgage rates in the new primary-secondary spread model is compounded by higher turnover projections in the new prepayment model.

FIGURE 19

**Effect of primary-secondary model changes on valuations**

| | | Prod V1.36.4 | | | | Beta V1.37 P-S V1.4 | | | | Beta V1.37 P-S V2.0 | | | | PSS Change | | | | Overall Change | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TBA | Price | OAS | OAD | 1-Yr | Life | OAS | OAD | 1-Yr | Life | OAS | OAD | 1-Yr | Life | OAS | OAD | 1-Yr | Life | OAS | OAD | 1-Yr | Life |
| 3.0 | 100-00+ | 32 | 7.0 | 3.2 | 6.8 | 35 | 6.9 | 3.3 | 7.2 | 30 | 6.4 | 3.4 | 7.6 | -5 | -0.5 | 0.1 | 0.4 | -3 | -0.6 | 0.2 | 0.8 |
| 3.5 | 103-09 | 34 | 5.7 | 6.6 | 9.3 | 33 | 5.5 | 5.7 | 9.9 | 26 | 5.0 | 6.3 | 10.9 | -8 | -0.5 | 0.6 | 1.0 | -8 | -0.7 | -0.3 | 1.6 |
| 4.0 | 105-31 | 35 | 4.3 | 14.5 | 13.3 | 29 | 3.8 | 17.8 | 14.9 | 22 | 3.3 | 18.8 | 15.8 | -8 | -0.5 | 1.0 | 0.9 | -13 | -1.0 | 4.3 | 2.5 |
| 4.5 | 108-04 | 35 | 3.3 | 19.3 | 16.9 | 40 | 3.6 | 18.8 | 16.3 | 34 | 3.2 | 19.2 | 16.9 | -6 | -0.4 | 0.4 | 0.6 | -1 | 0.0 | -0.1 | 0.0 |
| 5.0 | 110-06 | 8 | 2.0 | 25.7 | 23.6 | 16 | 2.3 | 24.2 | 22.3 | 12 | 2.0 | 24.6 | 22.7 | -5 | -0.3 | 0.4 | 0.4 | 4 | 0.0 | -1.1 | -0.9 |
| IOS | Price | OAS | OAD | 1-Yr | Life | OAS | OAD | 1-Yr | Life | OAS | OAD | 1-Yr | Life | OAS | OAD | 1-Yr | Life | OAS | OAD | 1-Yr | Life |
| IFN-33013 IO | 20-26+ | 124 | -7.8 | 6.4 | 7.2 | 74 | -8.3 | 7.0 | 7.8 | 18 | -12.9 | 7.1 | 8.1 | -56 | -4.6 | 0.1 | 0.3 | -106 | -5.1 | 0.7 | 0.9 |
| IFN-33512 IO | 21-22+ | 169 | -11.7 | 8.7 | 9.0 | 111 | -12.5 | 9.4 | 9.7 | 47 | -17.2 | 9.9 | 10.3 | -63 | -4.8 | 0.5 | 0.6 | -122 | -5.5 | 1.2 | 1.3 |
| IFN-34014 IO | 21-28+ | 200 | -22.7 | 14.3 | 13.1 | 134 | -23.8 | 15.8 | 13.8 | 65 | -29.0 | 16.6 | 14.5 | -70 | -5.3 | 0.8 | 0.7 | -135 | -6.4 | 2.3 | 1.4 |
| IFN-34511 IO | 23-04 | 165 | -18.3 | 15.4 | 13.5 | 130 | -17.1 | 15.4 | 13.7 | 69 | -21.7 | 16.0 | 14.3 | -61 | -4.6 | 0.6 | 0.6 | -96 | -3.4 | 0.6 | 0.8 |
| IFN-35010 IO | 22-26 | 243 | -17.1 | 17.7 | 16.0 | 158 | -18.3 | 18.8 | 16.9 | 112 | -21.3 | 19.3 | 17.6 | -46 | -3.0 | 0.5 | 0.7 | -131 | -4.3 | 1.6 | 1.6 |

Note: Data as of November 6, 2015. Source: Barclays Research

## Updates to the GSE delivery fees

As part of its review process of the guarantee fees charged by the enterprises, the FHFA decided to make some targeted adjustments to delivery fees. These went into effect for all loans purchased by the GSEs on or after September 1, 2015.

*Removal of the AMDC*

A 25bp up-front "adverse market delivery charge" was established in 2008 as an add-on fee to reflect the unfavorable housing environment at that time. With the housing recovery firmly in place, the FHFA has decided that the fee is no longer warranted.

*Adjustments to the LLPA Matrix*

The FHFA also made several targeted adjustments to the LLPA matrix. Most notably, it directed the GSEs to increase delivery fees in the base LTV/FICO grid by 25bp for loans with LTV<=80 and FICO>=700. Figure 20 shows the new LLPA pricing matrix for Freddie Mac, with numbers in bold showing cells where fees were increased to offset the removal of the 25bp AMDC.

Figure 21 shows the combined effect of the AMDC and LLPA changes, providing a more transparent view of the net change in delivery fees. Overall, these two changes result in a 25bp decrease in upfront fees for weaker credit borrowers (those with credit scores lower than 700 and LTVs greater than 80). Overall, in terms of mortgage rate, the fee reduction is a modest 4-6bp, depending on the effective primary market IO multiple.

*Targeted increases for borrowers with risk layering attributes*

The FHFA also increased LLPAs for certain borrowers with "risk layering" attributes. Among the affected loan types were mortgages backed by investor properties, cash-out refinances, and loans with secondary financing. Each of these categories experienced a 37.5bp increase in upfront fees.

Finally, the FHFA increased upfront fees by 25bp for jumbo conforming borrowers, who have loan balances greater than the base conforming limit of $417k and up to 150% of the base limit for certain high cost areas. This increase will have a negligible effect for 30y TBA, as the 10% *de minimis* limit caps the effect to 2.5bp for a pool. That said, conforming jumbo pools (CK and T6 prefixes) will show some effect.

FIGURE 20

**New Freddie Mac LLPA matrix (non-refi plus loans)**

| FICO / LTV | <= 60 | > 60 & <= 70 | > 70 & <= 75 | > 75 & <= 80 | > 80 & <= 85 | > 85 & <= 90 | > 90 & <= 95 |
|---|---|---|---|---|---|---|---|
| >= 740 | **0** | **25** | **25** | **50** | 25 | 25 | 25 |
| >= 720 & < 740 | **0** | **25** | **50** | **75** | 50 | 50 | 50 |
| >= 700 & < 720 | **0** | 50 | **100** | **125** | 100 | 100 | 100 |
| >= 680 & < 700 | 0 | 50 | 125 | 175 | 150 | 125 | 125 |
| >= 660 & < 680 | 0 | 100 | 225 | 275 | 275 | 225 | 225 |
| >= 640 & < 660 | 50 | 125 | 275 | 300 | 325 | 275 | 275 |
| >= 620 & < 640 | 50 | 150 | 300 | 300 | 325 | 325 | 325 |
| < 620 | 50 | 150 | 300 | 300 | 325 | 325 | 325 |

Source: Freddie Mac, Barclays Research

FIGURE 21

**Net changes in AMDC plus LLPA matrix (non-refi plus loans)**

| FICO / LTV | <= 60 | > 60 & <= 70 | > 70 & <= 75 | > 75 & <= 80 | > 80 & <= 85 | > 85 & <= 90 | > 90 & <= 95 |
|---|---|---|---|---|---|---|---|
| >= 740 | 0 | 0 | 0 | 0 | -25 | -25 | -25 |
| >= 720 & < 740 | 0 | 0 | 0 | 0 | -25 | -25 | -25 |
| >= 700 & < 720 | 0 | -25 | 0 | 0 | -25 | -25 | -25 |
| >= 680 & < 700 | -25 | -25 | -25 | -25 | -25 | -25 | -25 |
| >= 660 & < 680 | -25 | -25 | -25 | -25 | -25 | -25 | -25 |
| >= 640 & < 660 | -25 | -25 | -25 | -25 | -25 | -25 | -25 |
| >= 620 & < 640 | -25 | -25 | -25 | -25 | -25 | -25 | -25 |
| < 620 | -25 | -25 | -25 | -25 | -25 | -25 | -25 |

Source: Freddie Mac, Barclays Research

*Quantifying the prepayment effect*

The prepayment and OAS impact for selected securities are shown in Figure 22. Given the limited nature of the fee changes, the prepayment and valuation effect is minimal. The largest effects are 1y CPR changes of 0.2-0.3 CPR, although most cohorts had more modest effects.

More interesting effects were observed for specified pool categories. One-year CPR projections on investor property and conforming jumbo pools decline 1-2 CPR, while one-year CPR projections on low FICO pools increase approximately 0.5 CPR.

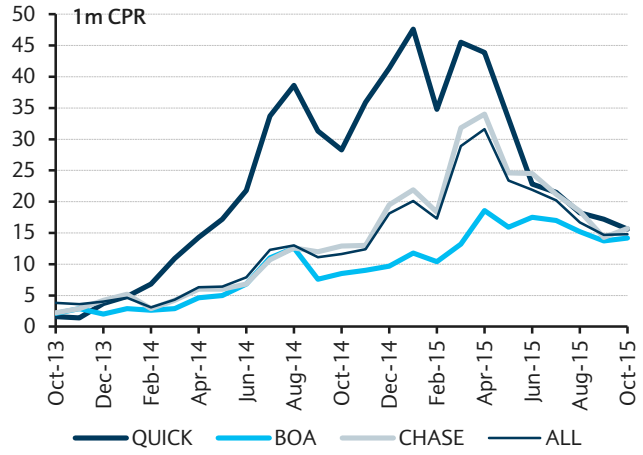
FIGURE 22

**Prepayment and valuation effect for LLPA and AMDC changes**

| | | Beta V1.37, old LLPA | | | | Beta V1.37 | | | | Change | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TBA** | **Price** | **OAS** | **OAD** | **1-Yr** | **Life** | **OAS** | **OAD** | **1-Yr** | **Life** | **OAS** | **OAD** | **1-Yr** | **Life** |
| 3.0 | 100-00+ | 30 | 6.4 | 3.4 | 7.6 | 30 | 6.4 | 3.4 | 7.6 | 0 | 0.0 | 0.0 | 0.0 |
| 3.5 | 103-09 | 26 | 5.0 | 6.6 | 11.0 | 26 | 5.0 | 6.3 | 10.9 | 0 | 0.0 | -0.3 | -0.1 |
| 4.0 | 105-31 | 22 | 3.3 | 19.2 | 15.9 | 22 | 3.3 | 18.8 | 15.8 | 0 | 0.0 | -0.4 | -0.1 |
| 4.5 | 108-04 | 34 | 3.2 | 19.4 | 17.1 | 34 | 3.2 | 19.2 | 16.9 | 1 | 0.0 | -0.2 | -0.2 |
| 5.0 | 110-06 | 11 | 2.0 | 24.6 | 22.7 | 12 | 2.0 | 24.6 | 22.7 | 0 | 0.0 | 0.0 | 0.0 |
| **IOS** | **Price** | **OAS** | **OAD** | **1-Yr** | **Life** | **OAS** | **OAD** | **1-Yr** | **Life** | **OAS** | **OAD** | **1-Yr** | **Life** |
| IFN-33013 IO | 20-26+ | 18 | -13.0 | 7.1 | 8.1 | 18 | -12.9 | 7.1 | 8.1 | 1 | 0.0 | 0.0 | 0.0 |
| IFN-33512 IO | 21-22+ | 47 | -17.3 | 10.0 | 10.3 | 47 | -17.2 | 9.9 | 10.3 | 1 | 0.1 | -0.1 | 0.0 |
| IFN-34014 IO | 21-28+ | 62 | -29.0 | 16.8 | 14.5 | 65 | -29.0 | 16.6 | 14.5 | 3 | 0.0 | -0.2 | 0.0 |
| IFN-34511 IO | 23-04 | 68 | -21.8 | 16.0 | 14.3 | 69 | -21.7 | 16.0 | 14.3 | 2 | 0.1 | 0.0 | 0.0 |
| IFN-35010 IO | 22-26 | 109 | -21.4 | 19.3 | 17.6 | 112 | -21.3 | 19.3 | 17.6 | 3 | 0.0 | 0.0 | 0.0 |
| **Investor** | **Price** | **OAS** | **OAD** | **1-Yr** | **Life** | **OAS** | **OAD** | **1-Yr** | **Life** | **OAS** | **OAD** | **1-Yr** | **Life** |
| FNCL 3.5 12 INV+ | 103-09 | 42 | 5.7 | 8.3 | 8.7 | 44 | 5.8 | 8.1 | 8.5 | 1 | 0.1 | -0.2 | -0.2 |
| FNCL 4 13 INV+ | 105-31+ | 36 | 4.3 | 14.1 | 12.5 | 38 | 4.4 | 13.0 | 11.9 | 2 | 0.1 | -1.1 | -0.6 |
| FNCL 4 12 INV+ | 105-31+ | 43 | 4.6 | 11.9 | 11.3 | 45 | 4.7 | 11.2 | 10.9 | 2 | 0.1 | -0.7 | -0.4 |
| FNCL 4.5 13 INV+ | 108-15 | 29 | 3.1 | 19.5 | 16.8 | 32 | 3.2 | 18.5 | 16.0 | 3 | 0.1 | -1.0 | -0.8 |
| FNCL 4.5 11 INV+ | 108-15 | 35 | 3.1 | 16.5 | 14.6 | 38 | 3.2 | 15.6 | 14.0 | 3 | 0.1 | -0.9 | -0.6 |
| **FICO** | **Price** | **OAS** | **OAD** | **1-Yr** | **Life** | **OAS** | **OAD** | **1-Yr** | **Life** | **OAS** | **OAD** | **1-Yr** | **Life** |
| FNCL 3.5 12 FIC+ | 103-10 | 39 | 5.2 | 11.4 | 11.7 | 39 | 5.1 | 11.7 | 12.0 | -1 | 0.0 | 0.3 | 0.3 |
| FNCL 4 14 FIC+ | 106-09 | 24 | 4.0 | 14.4 | 15.5 | 23 | 4.0 | 14.6 | 15.8 | -1 | 0.0 | 0.2 | 0.3 |
| FNCL 4 13 FIC+ | 106-09 | 27 | 4.1 | 15.6 | 15.1 | 26 | 4.0 | 16.2 | 15.4 | -1 | 0.0 | 0.6 | 0.3 |
| FNCL 4.5 14 FIC+ | 108-23 | 25 | 3.4 | 17.5 | 17.1 | 24 | 3.3 | 17.7 | 17.3 | -1 | 0.0 | 0.2 | 0.2 |
| FNCL 4.5 13 FIC+ | 108-23 | 22 | 3.2 | 18.8 | 17.5 | 21 | 3.2 | 19.1 | 17.8 | -1 | 0.0 | 0.3 | 0.3 |
| **Jumbo** | **Price** | **OAS** | **OAD** | **1-Yr** | **Life** | **OAS** | **OAD** | **1-Yr** | **Life** | **OAS** | **OAD** | **1-Yr** | **Life** |
| FNJMCK 3.5 12 | 102-06 | 36 | 4.4 | 13.4 | 14.6 | 37 | 4.5 | 12.5 | 13.9 | 1 | 0.1 | -0.9 | -0.7 |
| FNJMCK 4 14 | 103-23 | 36 | 2.9 | 31.8 | 24.4 | 38 | 2.9 | 30.6 | 23.9 | 2 | 0.1 | -1.2 | -0.5 |
| FNJMCK 4 13 | 103-23 | 40 | 3.1 | 28.7 | 23.3 | 42 | 3.2 | 27.6 | 22.7 | 2 | 0.1 | -1.1 | -0.6 |
| FNJMCK 4 11 | 103-23 | 52 | 3.6 | 22.5 | 20.1 | 53 | 3.6 | 21.5 | 19.6 | 1 | 0.1 | -1.0 | -0.5 |
| FNJMCK 4 10 | 103-23 | 50 | 3.3 | 23.9 | 21.4 | 52 | 3.4 | 22.8 | 20.9 | 2 | 0.1 | -1.1 | -0.5 |

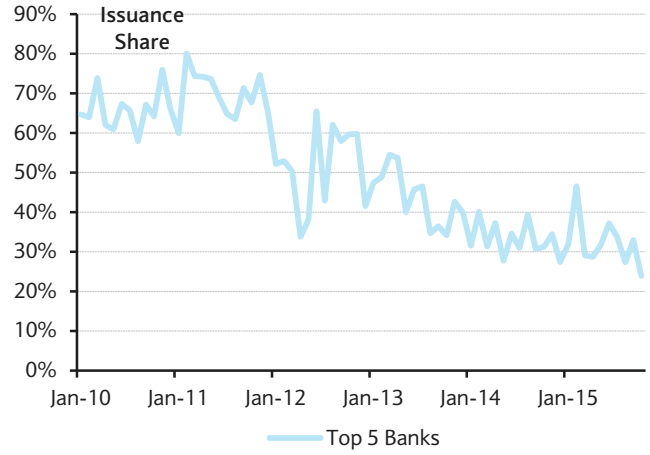
Note: Data as of November 6, 2015. Source: Barclays Research

FIGURE 23
**Divergence in servicer prepayments has increased**




Note: Gold 4 13 loan-level data. Source: Freddie Mac, Barclays Research

FIGURE 24
**Conventional issuance has shifted away from large banks**




Note: top five banks in this chart are Chase, Citibank, Bank of America, US Bank, and Wells Fargo. Source: Freddie Mac, Fannie Mae, Barclays Research

## Enhanced servicer effects in V1.37

Servicer effects in the present environment have taken on increased importance, for several reasons. One is that prepayment dispersion across servicers has increased during the past few years. A telling contrast in servicer behavior is revealed by a comparison of prepayments on Quicken- and Bank of America-serviced pools (Figure 23). Legal disputes with the GSEs and capital concerns surrounding their servicing footprint have led Bank of America to be one of the least aggressive servicers over the past few years. Over the same period, industry-leading processing efficiency has led Quicken to be among the most aggressive. The divergence of these servicers from the overall cohort in Figure 23 is significant and has caused a substantial amount of variation in prepayments across mortgage pools. Another important factor making servicer effects more pronounced is that servicing rights have become less concentrated in large traditional banks and instead have increasingly been moving to non-bank servicers and smaller lenders. This trend can be seen in Figure 24, which shows the combined share of conventional mortgage issuance of Bank of America, Chase, Citi Bank, US Bank and Wells Fargo, which has shrunk from more than 70% to less than 30% over the past three years.

Recognizing the importance of servicer effects in the current environment, model V1.37 includes servicer effects for the 30 largest conventional and GNMA servicers by UPB. Together, this covers approximately 85% of outstanding agency mortgage balances. With these modifications, the new model can more effectively project voluntary prepayments and delinquency buyouts across pools with different servicer distributions. Figure 25 summarizes the list of servicers for which distinctive servicer effects have been implemented in model version V1.37. In previous versions, servicer effects were limited to the four largest servicers, covering only 50% of loans by UPB.

### *Enhanced servicer disclosures in the mortgage calculator*

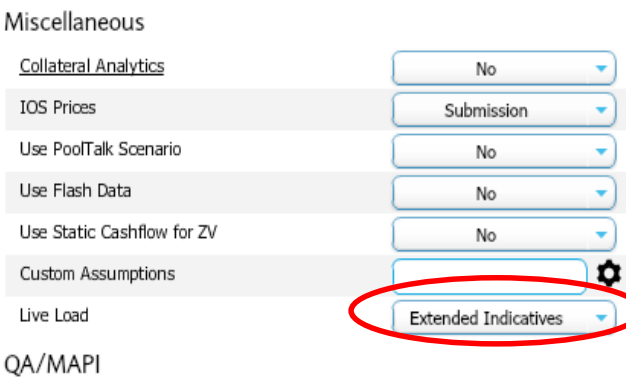
Along with the enhanced servicer effects in the model, we have expanded the servicer distribution data displayed in the mortgage calculator on Barclays Live to include the top 71 servicers of conventional and GNMA mortgages. To see the expanded set of servicers, users can set "Live Load" to "Extended Indicatives" in the preferences tab on the mortgage calculator (Figure 26).

FIGURE 25
**Servicers with unique effects in model V1.37**

| Model Servicer Effects V1.37 | | |
|---|---|---|
| ARVEST MORTGAGE | JPM CHASE | PNC BANK |
| BANK OF AMERICA | LAKEVIEW | PROVIDENT |
| BB&T BANK | MATRIX FINANCIAL | QUICKEN |
| CALIBER FUNDING | MIDFIRST BANK | ROUNDPOINT |
| CITIBANK | NATIONSTAR | SETERUS |
| DITECH/GREENTREE | NAVY FEDERAL | SUNTRUST |
| EVERBANK | NY COMMUNITY BANK | US BANK |
| FIFTH THIRD | OCWEN | WELLS FARGO |
| FLAGSTAR | OTHER | |
| FRANKLIN AMERICAN | PENNYMAC | |
| FREEDOM HOME | PHH | |

Source: Barclays Research

FIGURE 26
**Servicers with unique effects in model V1.37**




Source: Barclays Research

*Servicer effects on model prepayments*

Servicer effects influence model prepayments in several ways. First, we have added servicer specific multipliers to the base refinancing function. For faster servicers, this will lead to a greater refinancing response for a given rate incentive, while for slower servicers, the refinancing response is reduced. Second, there is a servicer-specific elbow shift. This captures more competitive mortgage rates and/or more aggressive solicitation practices on the part of some servicers that lead to a greater borrower response for only marginal levels of incentive. Lastly, for GNMA mortgages, we have added servicer-specific buyout rate multipliers. While most of the largest servicers tend to buy out 100% of their delinquent loans as soon as they become eligible, many of the medium to smaller servicers have buyout rates that are much lower. Model V1.37 takes these differences into account within the default model for GNMA pools.

*Examining servicer effects in model V1.37*

Figures 27 and 28 show conventional and GNMA prepayment projections and model errors for selected coupons and servicers. V1.37 does a much better job fitting conventional 12m CPRs for fast and slow servicers such as Quicken, Provident, and Bank of America. For GNMA collateral, the servicer-specific buyout rate multipliers produce a significant improvement in buyout-related errors between V1.36.4 and V1.37.

FIGURE 27

**Conventional prepayments for servicer cohorts under model V1.36.4 and V1.37**

| | Actual | | Model 1.36.4 | | 1.36.4 Error | | Model 1.37 | | 1.37 Error | |
|---|---|---|---|---|---|---|---|---|---|---|
| FNCL 4 Servicer Cohorts | 6m CPR | 12m CPR | 6m CPR | 12m CPR | 6m CPR | 12m CPR | 6m CPR | 12m CPR | 6m CPR | 12m CPR |
| BANK OF AMERICA | 17.7 | 16.3 | 17.4 | 16.1 | -0.3 | -0.2 | 18.5 | 17.1 | 0.8 | 0.8 |
| DITECH | 15.8 | 18.1 | 16.5 | 17.2 | 0.7 | -0.9 | 16.8 | 17.2 | 1.0 | -0.9 |
| EVERBANK | 16.2 | 15.7 | 15.9 | 15.0 | -0.3 | -0.7 | 16.8 | 15.9 | 0.6 | 0.2 |
| FIFTH THIRD | 16.9 | 15.5 | 15.3 | 14.4 | -1.6 | -1.1 | 16.4 | 15.3 | -0.5 | -0.2 |
| FLAGSTAR | 19.9 | 21.6 | 17.6 | 16.1 | -2.3 | -5.5 | 17.9 | 16.1 | -2.0 | -5.5 |
| FRANKLIN AMERICAN | 13.3 | 14.5 | 16.7 | 16.8 | 3.4 | 2.3 | 15.3 | 14.8 | 2.0 | 0.3 |
| JPMCHASE | 16.4 | 15.8 | 17.7 | 16.5 | 1.3 | 0.7 | 18.1 | 16.9 | 1.7 | 1.1 |
| NATIONSTAR | 18.5 | 19.2 | 15.9 | 15.5 | -2.6 | -3.7 | 20.8 | 19.9 | 2.3 | 0.7 |
| NYCB | 20.0 | 19.6 | 18.6 | 17.7 | -1.4 | -1.9 | 20.9 | 19.5 | 0.9 | -0.1 |
| OCWEN | 16.2 | 13.8 | 17.9 | 16.4 | 1.7 | 2.6 | 17.9 | 16.3 | 1.7 | 2.5 |
| PENNYMAC | 18.7 | 19.7 | 21.6 | 20.3 | 2.9 | 0.6 | 21.2 | 18.9 | 2.5 | -0.8 |
| PHH | 16.4 | 14.8 | 17.2 | 15.8 | 0.8 | 1.0 | 16.9 | 15.5 | 0.5 | 0.7 |
| PNCBANK | 13.4 | 12.5 | 15.0 | 14.0 | 1.6 | 1.5 | 14.4 | 13.3 | 1.0 | 0.8 |
| QUICKEN | 19.3 | 30.3 | 11.5 | 11.7 | -7.8 | -18.6 | 24.3 | 25.8 | 5.0 | -4.5 |
| ROUNDPOINT | 17.0 | 18.4 | 20.6 | 20.2 | 3.6 | 1.8 | 18.8 | 17.8 | 1.8 | -0.6 |
| SUNTRUST | 18.4 | 17.0 | 18.7 | 17.3 | 0.3 | 0.3 | 19.1 | 17.7 | 0.7 | 0.7 |
| USBANK | 15.7 | 15.0 | 17.0 | 15.8 | 1.3 | 0.8 | 16.1 | 15.2 | 0.4 | 0.2 |
| | Actual | | Model 1.36.4 | | 1.36.4 Error | | Model 1.37 | | 1.37 Error | |
| FNCL 4.5 Servicer Cohorts | 6m CPR | 12m CPR | 6m CPR | 12m CPR | 6m CPR | 12m CPR | 6m CPR | 12m CPR | 6m CPR | 12m CPR |
| BANK OF AMERICA | 22.3 | 20.8 | 22.0 | 20.5 | -0.3 | -0.3 | 21.9 | 20.6 | -0.4 | -0.2 |
| DITECH | 14.1 | 12.8 | 14.9 | 14.0 | 0.8 | 1.2 | 14.6 | 13.5 | 0.5 | 0.7 |
| EVERBANK | 21.7 | 20.2 | 22.1 | 20.8 | 0.4 | 0.6 | 22.0 | 20.7 | 0.3 | 0.5 |
| JPMCHASE | 19.4 | 18.5 | 20.8 | 19.6 | 1.4 | 1.1 | 20.7 | 19.4 | 1.3 | 0.9 |
| NATIONSTAR | 18.1 | 16.9 | 15.4 | 14.6 | -2.7 | -2.3 | 19.0 | 17.7 | 0.9 | 0.8 |
| OCWEN | 20.9 | 18.8 | 23.8 | 22.2 | 2.9 | 3.4 | 22.0 | 20.4 | 1.1 | 1.6 |
| PHH | 20.0 | 18.1 | 22.6 | 21.1 | 2.6 | 3.0 | 20.5 | 19.1 | 0.5 | 1.0 |
| PNCBANK | 20.3 | 18.7 | 20.3 | 19.0 | 0.0 | 0.3 | 18.9 | 17.7 | -1.4 | -1.0 |
| QUICKEN | 20.9 | 23.1 | 14.0 | 13.2 | -6.9 | -9.9 | 26.0 | 24.7 | 5.1 | 1.6 |
| SUNTRUST | 23.0 | 21.6 | 23.1 | 21.6 | 0.1 | 0.0 | 22.0 | 20.6 | -1.0 | -1.0 |
| USBANK | 21.4 | 19.7 | 21.7 | 20.2 | 0.3 | 0.5 | 21.3 | 19.8 | -0.1 | 0.1 |

Note: October prepayment report. Source: Fannie Mae, Barclays Research

FIGURE 28

**GNMA prepayments for servicer cohorts under model V1.36.4 and V1.37**

| | Actual | | Model 1.36.4 | | 1.36.4 Error | | Model 1.37 | | 1.37 Error | |
|---|---|---|---|---|---|---|---|---|---|---|
| GNSF 4 Servicer Cohorts | 12m CRR | 12m CBR | 12m CRR | 12m CBR | 12m CRR | 12m CBR | 12m CRR | 12m CBR | 12m CRR | 12m CBR |
| BofA | 20.4 | 1.6 | 18.6 | 5.9 | -1.8 | 4.3 | 19.6 | 7.1 | -0.8 | 5.5 |
| JPMCHASE | 12.8 | 3.1 | 13.2 | 0.9 | 0.4 | -2.2 | 14.7 | 2.9 | 1.9 | -0.2 |
| LAKEVIEW | 19.6 | 5.4 | 16.3 | 5.5 | -3.3 | 0.1 | 19.1 | 3.9 | -0.5 | -1.5 |
| NATIONSTAR | 19.3 | 1.9 | 16.7 | 3.3 | -2.6 | 1.4 | 18.8 | 2.2 | -0.5 | 0.3 |
| OCWEN | 21.6 | 2.0 | 17.9 | 10.8 | -3.7 | 8.8 | 19.1 | 3.1 | -2.5 | 1.1 |
| PENNYMAC | 14.8 | 2.7 | 12.3 | 3.5 | -2.5 | 0.8 | 15.6 | 2.9 | 0.8 | 0.2 |
| PHH | 15.8 | 1.6 | 18.9 | 5.6 | 3.1 | 4.0 | 19.2 | 1.6 | 3.4 | 0.0 |
| SUNTRUST | 17.9 | 2.3 | 17.3 | 1.4 | -0.6 | -0.9 | 17.8 | 2.2 | -0.1 | -0.1 |
| USBANK | 13.4 | 2.8 | 14.2 | 1.5 | 0.8 | -1.3 | 17.8 | 3.0 | 4.4 | 0.2 |
| | Actual | | Model 1.36.4 | | 1.36.4 Error | | Model 1.37 | | 1.37 Error | |
| GNSF 4.5 Servicer Cohorts | 12m CRR | 12m CBR | 12m CRR | 12m CBR | 12m CRR | 12m CBR | 12m CRR | 12m CBR | 12m CRR | 12m CBR |
| BB&T | 15.5 | 3.9 | 17.4 | 13.8 | 1.9 | 9.9 | 18.4 | 3.9 | 2.9 | 0.0 |
| BofA | 20.6 | 3.1 | 20.6 | 6.7 | 0.0 | 3.6 | 20.6 | 8.0 | 0.0 | 4.9 |
| JPMCHASE | 15.5 | 3.7 | 16.0 | 1.2 | 0.5 | -2.5 | 17.7 | 3.8 | 2.2 | 0.1 |
| LAKEVIEW | 19.4 | 7.0 | 18.6 | 6.9 | -0.8 | -0.1 | 20.9 | 5.3 | 1.5 | -1.7 |
| MATRIX | 17.6 | 3.0 | 18.8 | 12.1 | 1.2 | 9.1 | 19.7 | 3.4 | 2.1 | 0.4 |
| NATIONSTAR | 21.6 | 2.6 | 19.7 | 4.1 | -1.9 | 1.5 | 21.0 | 2.8 | -0.6 | 0.2 |
| OCWEN | 22.8 | 4.5 | 18.7 | 16.9 | -4.1 | 12.4 | 19.6 | 4.9 | -3.2 | 0.4 |
| PENNYMAC | 20.7 | 3.6 | 20.8 | 2.4 | 0.1 | -1.2 | 22.0 | 2.0 | 1.3 | -1.6 |
| PHH | 19.2 | 3.1 | 19.1 | 10.3 | -0.1 | 7.2 | 18.1 | 3.0 | -1.1 | -0.1 |
| PNCBANK | 18.3 | 3.4 | 17.1 | 2.9 | -1.2 | -0.5 | 18.0 | 4.5 | -0.3 | 1.1 |
| SUNTRUST | 19.4 | 2.7 | 18.9 | 1.7 | -0.5 | -1.0 | 19.3 | 2.7 | -0.1 | 0.0 |
| USBANK | 16.6 | 3.1 | 16.5 | 1.9 | -0.1 | -1.2 | 17.2 | 3.7 | 0.6 | 0.6 |

Note: October prepayment report. Source: Ginnie Mae, Barclays Research

## New servicer knobs available in the calculator

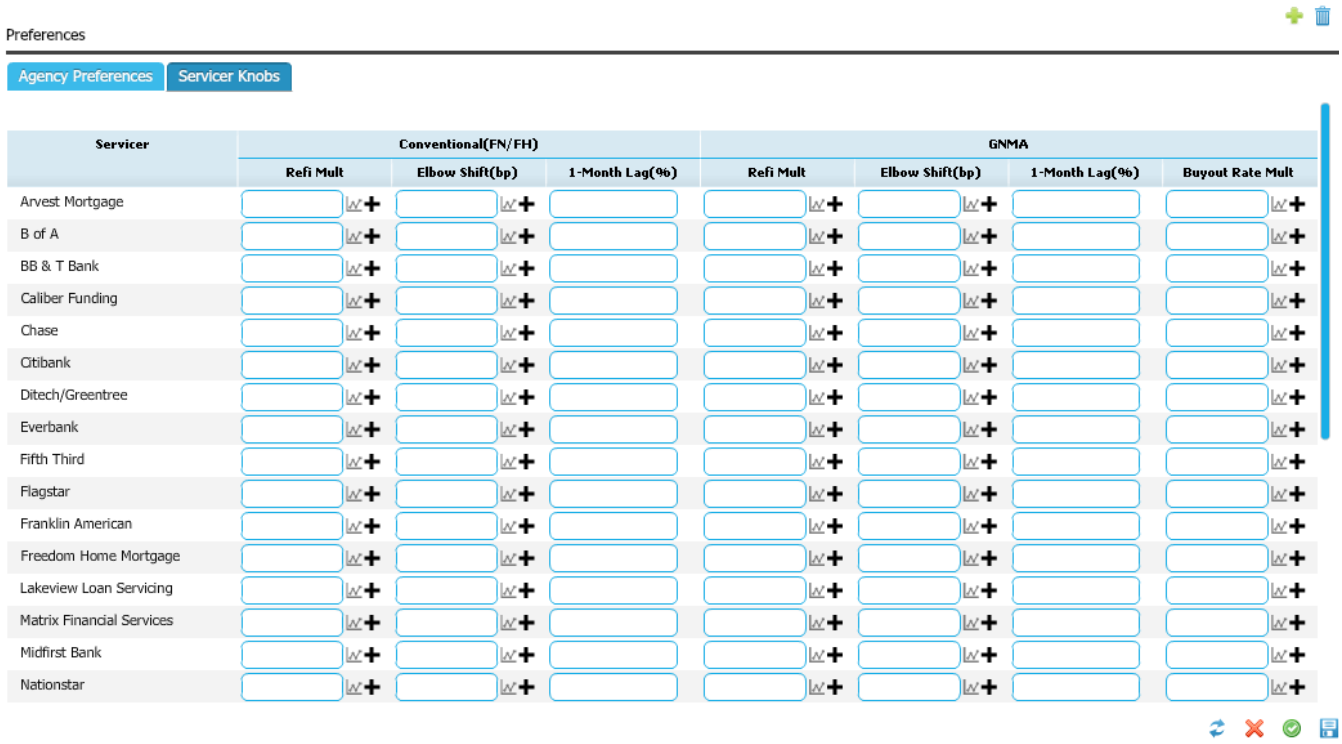
V1.37 also gives users considerable flexibility in altering model servicer effects. Below is a list of servicer knobs users can adjust in the model.

- Refinancing multiplier: Users can choose servicer-specific refinancing multipliers, which can be entered as scalars or vectors indexed by WALA, factor date or origination date.
- Elbow shift: Users can select servicer-specific elbow shifts, which can be entered as scalars or vectors indexed by WALA, factor date, origination date or loan size.
- Refinance incentive lag: Users can adjust lags for each servicer used to calculate the rate incentive in the model. By default, the refinance incentive lag weights for conventional mortgages (representing the lag between rate lock and mortgage closing) are 47% on rates one month prior to the prepayment month and 53% on rates two months prior to the prepayment month. These knobs allow users to mimic the prepayment profiles of servicers who respond more quickly/slowly than average to changes interest rates.
- GNMA buyout rate: For GNMA mortgages, users can choose servicer-specific buyout rate multipliers. Base buyout rates in V1.37 are 20-25%. Thus, to set the buyout rate to 100% for a specific servicer, one needs to apply a buyout rate multiplier of approximately five. This can be entered as scalars or vectors indexed by factor date.

Figure 29 shows a snapshot of the new servicer knobs page available in the calculator under the preferences tab.

FIGURE 29

**New servicer knobs in the calculator**




Source: Barclays Research

# Appendix: OAS effect of model changes, Prod V1.36.4 vs. Beta V1.37

FIGURE 30

**FN 30Y, Market Rates: NY 3PM Close of Fri, Nov 06, 2015**

| | | | Prod V1.36.4 | | | | | | | | Beta V1.37 | | | | | | | | Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coupon | Vintage | Price | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life |
| 3.0 | TBA | 100-00+ | 2.99 | 68 | 32 | 7.0 | 7.4 | 3.2 | 4.9 | 6.8 | 2.99 | 69 | 30 | 6.4 | 6.9 | 3.4 | 5.4 | 7.6 | 0.00 | 2 | -3 | -0.6 | -0.5 | 0.2 | 0.5 | 0.8 |
| 3.0 | 2013 | 100-03+ | 2.98 | 71 | 43 | 6.9 | 7.0 | 6.5 | 6.6 | 7.1 | 2.97 | 72 | 42 | 6.3 | 6.6 | 7.1 | 7.3 | 8.0 | 0.00 | 2 | -2 | -0.5 | -0.4 | 0.6 | 0.7 | 0.9 |
| 3.0 | 2012 | 100-05+ | 2.97 | 71 | 43 | 6.8 | 6.9 | 6.5 | 6.5 | 7.1 | 2.96 | 72 | 42 | 6.3 | 6.5 | 7.2 | 7.3 | 7.9 | 0.00 | 2 | -2 | -0.5 | -0.4 | 0.7 | 0.8 | 0.8 |
| 3.5 | TBA | 103-09 | 2.98 | 80 | 34 | 5.7 | 6.7 | 6.6 | 7.7 | 9.3 | 2.93 | 81 | 26 | 5.0 | 6.2 | 6.3 | 9.1 | 10.9 | -0.05 | 1 | -8 | -0.7 | -0.5 | -0.3 | 1.4 | 1.6 |
| 3.5 | 2014 | 103-09 | 2.92 | 79 | 30 | 5.2 | 6.1 | 10.5 | 10.3 | 11.0 | 2.86 | 79 | 25 | 4.6 | 5.7 | 12.3 | 12.4 | 12.6 | -0.06 | 0 | -5 | -0.6 | -0.4 | 1.8 | 2.1 | 1.6 |
| 3.5 | 2013 | 103-09 | 2.98 | 80 | 47 | 6.0 | 6.5 | 8.0 | 8.2 | 8.6 | 2.95 | 80 | 42 | 5.4 | 6.1 | 9.0 | 9.3 | 9.7 | -0.04 | 0 | -5 | -0.6 | -0.4 | 1.0 | 1.1 | 1.1 |
| 3.5 | 2012 | 103-12 | 2.96 | 79 | 47 | 5.9 | 6.4 | 8.4 | 8.3 | 8.6 | 2.92 | 79 | 42 | 5.3 | 6.0 | 9.5 | 9.4 | 9.7 | -0.04 | 0 | -5 | -0.6 | -0.4 | 1.1 | 1.1 | 1.1 |
| 3.5 | 2011 | 103-12+ | 2.92 | 79 | 42 | 5.4 | 6.2 | 9.2 | 9.0 | 9.4 | 2.88 | 79 | 37 | 4.9 | 5.8 | 10.4 | 10.2 | 10.6 | -0.04 | 0 | -5 | -0.5 | -0.4 | 1.2 | 1.2 | 1.2 |
| 3.5 | 2010 | 103-13+ | 2.87 | 79 | 40 | 5.0 | 5.8 | 10.3 | 10.0 | 10.5 | 2.83 | 78 | 34 | 4.5 | 5.5 | 11.7 | 11.4 | 11.7 | -0.05 | 0 | -5 | -0.5 | -0.4 | 1.4 | 1.4 | 1.2 |
| 4.0 | TBA | 105-31 | 2.80 | 87 | 35 | 4.3 | 5.7 | 14.5 | 13.8 | 13.3 | 2.63 | 83 | 22 | 3.3 | 5.2 | 18.8 | 17.5 | 15.8 | -0.17 | -4 | -13 | -1.0 | -0.5 | 4.3 | 3.7 | 2.5 |
| 4.0 | 2014 | 105-31 | 2.87 | 88 | 40 | 4.5 | 5.8 | 12.9 | 12.5 | 12.2 | 2.78 | 86 | 31 | 3.8 | 5.4 | 15.3 | 14.4 | 13.6 | -0.09 | -2 | -8 | -0.7 | -0.4 | 2.4 | 1.9 | 1.4 |
| 4.0 | 2013 | 105-31 | 2.88 | 88 | 41 | 4.4 | 5.7 | 13.1 | 12.4 | 11.9 | 2.81 | 86 | 35 | 4.0 | 5.4 | 14.7 | 13.7 | 12.9 | -0.06 | -2 | -5 | -0.5 | -0.3 | 1.6 | 1.3 | 1.0 |
| 4.0 | 2012 | 106-08 | 2.93 | 84 | 56 | 5.5 | 6.0 | 10.2 | 10.1 | 9.8 | 2.88 | 82 | 49 | 4.8 | 5.7 | 11.2 | 11.0 | 10.7 | -0.06 | -2 | -7 | -0.7 | -0.3 | 1.0 | 0.9 | 0.9 |
| 4.0 | 2011 | 106-08 | 2.87 | 84 | 42 | 4.5 | 5.7 | 11.6 | 11.1 | 10.8 | 2.82 | 83 | 37 | 4.1 | 5.4 | 12.6 | 11.9 | 11.5 | -0.04 | -1 | -6 | -0.4 | -0.3 | 1.0 | 0.8 | 0.7 |
| 4.0 | 2010 | 106-08 | 2.82 | 83 | 40 | 4.3 | 5.5 | 12.3 | 11.6 | 11.3 | 2.77 | 81 | 34 | 3.8 | 5.3 | 13.3 | 12.5 | 12.1 | -0.05 | -2 | -6 | -0.5 | -0.3 | 1.0 | 0.9 | 0.8 |
| 4.0 | 2009 | 105-31 | 2.59 | 82 | 28 | 3.1 | 4.9 | 17.1 | 15.5 | 15.3 | 2.54 | 81 | 22 | 2.8 | 4.6 | 18.0 | 16.4 | 16.2 | -0.05 | -1 | -6 | -0.4 | -0.2 | 0.9 | 0.9 | 0.9 |
| 4.5 | TBA | 108-04 | 2.56 | 89 | 35 | 3.3 | 5.1 | 19.3 | 18.0 | 16.9 | 2.56 | 87 | 34 | 3.2 | 4.9 | 19.2 | 17.8 | 16.9 | 0.00 | -2 | -1 | 0.0 | -0.1 | -0.1 | -0.2 | 0.0 |
| 4.5 | 2014 | 108-04 | 2.96 | 102 | 60 | 4.2 | 5.6 | 13.1 | 12.6 | 12.3 | 2.83 | 97 | 52 | 3.7 | 5.2 | 14.7 | 14.3 | 13.9 | -0.14 | -5 | -9 | -0.5 | -0.4 | 1.6 | 1.7 | 1.6 |
| 4.5 | 2013 | 108-04 | 2.89 | 99 | 56 | 3.9 | 5.4 | 14.8 | 13.8 | 13.1 | 2.80 | 95 | 51 | 3.7 | 5.2 | 15.5 | 14.7 | 14.1 | -0.09 | -4 | -4 | -0.2 | -0.3 | 0.7 | 0.9 | 1.0 |
| 4.5 | 2012 | 108-12 | 2.97 | 94 | 70 | 5.1 | 5.6 | 11.5 | 11.4 | 11.1 | 2.89 | 90 | 61 | 4.5 | 5.3 | 12.6 | 12.4 | 12.1 | -0.08 | -3 | -9 | -0.7 | -0.3 | 1.1 | 1.0 | 1.0 |
| 4.5 | 2011 | 108-12 | 2.81 | 93 | 49 | 3.6 | 5.3 | 15.0 | 13.8 | 12.8 | 2.73 | 91 | 42 | 3.1 | 5.0 | 15.7 | 14.7 | 13.8 | -0.08 | -2 | -8 | -0.5 | -0.3 | 0.7 | 0.9 | 1.0 |
| 4.5 | 2010 | 108-10 | 2.71 | 91 | 43 | 3.2 | 5.1 | 16.0 | 14.9 | 14.0 | 2.63 | 89 | 36 | 2.8 | 4.9 | 16.5 | 15.6 | 14.8 | -0.07 | -2 | -7 | -0.4 | -0.2 | 0.5 | 0.7 | 0.8 |
| 4.5 | 2009 | 108-04 | 2.66 | 91 | 42 | 3.0 | 4.9 | 16.7 | 15.3 | 14.7 | 2.59 | 89 | 35 | 2.5 | 4.7 | 17.1 | 16.0 | 15.5 | -0.07 | -2 | -7 | -0.4 | -0.2 | 0.4 | 0.7 | 0.8 |
| 5.0 | TBA | 110-06 | 1.73 | 47 | 8 | 2.0 | 3.9 | 25.7 | 24.6 | 23.6 | 1.83 | 53 | 12 | 2.0 | 3.9 | 24.6 | 23.6 | 22.7 | 0.10 | 7 | 4 | 0.0 | 0.0 | -1.1 | -1.0 | -0.9 |
| 5.0 | 2011 | 110-10 | 2.72 | 98 | 61 | 3.5 | 5.0 | 16.7 | 15.9 | 14.8 | 2.54 | 93 | 47 | 2.8 | 4.7 | 18.6 | 17.6 | 16.5 | -0.18 | -6 | -14 | -0.7 | -0.3 | 1.9 | 1.7 | 1.7 |
| 5.0 | 2010 | 110-10 | 2.56 | 93 | 51 | 3.0 | 4.8 | 18.2 | 17.3 | 16.1 | 2.38 | 88 | 39 | 2.4 | 4.6 | 19.9 | 18.9 | 17.8 | -0.18 | -5 | -13 | -0.6 | -0.3 | 1.7 | 1.6 | 1.7 |
| 5.0 | 2009 | 110-06 | 2.51 | 92 | 50 | 2.9 | 4.7 | 19.1 | 17.7 | 16.6 | 2.35 | 87 | 39 | 2.3 | 4.5 | 20.5 | 19.2 | 18.1 | -0.16 | -4 | -11 | -0.5 | -0.2 | 1.4 | 1.5 | 1.5 |
| 5.0 | 2008 | 110-06 | 1.87 | 54 | 16 | 2.1 | 4.0 | 24.9 | 23.5 | 22.3 | 1.96 | 59 | 19 | 2.2 | 4.0 | 23.7 | 22.6 | 21.4 | 0.09 | 6 | 3 | 0.0 | 0.0 | -1.2 | -0.9 | -0.9 |
| 5.0 | 2005 | 110-10 | 2.06 | 58 | 29 | 2.6 | 4.1 | 21.6 | 20.6 | 19.4 | 2.19 | 65 | 35 | 2.8 | 4.1 | 20.0 | 19.3 | 18.3 | 0.12 | 6 | 6 | 0.2 | 0.1 | -1.6 | -1.3 | -1.1 |
| 5.0 | 2004 | 110-16 | 2.29 | 68 | 44 | 3.1 | 4.3 | 18.2 | 17.1 | 16.2 | 2.35 | 71 | 47 | 3.3 | 4.3 | 17.1 | 16.3 | 15.7 | 0.06 | 2 | 4 | 0.2 | 0.0 | -1.1 | -0.8 | -0.5 |
| 5.0 | 2003 | 110-22 | 2.34 | 69 | 46 | 3.3 | 4.3 | 16.4 | 15.5 | 14.8 | 2.37 | 69 | 48 | 3.4 | 4.3 | 15.7 | 15.0 | 14.5 | 0.03 | 1 | 2 | 0.1 | 0.0 | -0.7 | -0.5 | -0.3 |
| 5.5 | TBA | 111-24 | 1.56 | 23 | 0 | 1.7 | 3.6 | 26.8 | 26.0 | 24.8 | 1.77 | 39 | 12 | 1.9 | 3.7 | 24.9 | 24.2 | 23.2 | 0.22 | 17 | 12 | 0.2 | 0.1 | -1.9 | -1.8 | -1.6 |
| 5.5 | 2008 | 111-24 | 2.00 | 57 | 30 | 2.2 | 4.0 | 24.0 | 22.8 | 21.5 | 2.18 | 69 | 40 | 2.4 | 4.0 | 22.2 | 21.2 | 20.1 | 0.18 | 12 | 10 | 0.2 | 0.1 | -1.8 | -1.6 | -1.4 |
| 5.5 | 2007 | 111-24 | 1.87 | 44 | 21 | 2.1 | 3.8 | 24.6 | 23.7 | 22.3 | 2.02 | 55 | 29 | 2.2 | 3.9 | 23.1 | 22.4 | 21.2 | 0.15 | 11 | 8 | 0.1 | 0.1 | -1.5 | -1.3 | -1.1 |
| 5.5 | 2006 | 111-24 | 2.05 | 55 | 32 | 2.4 | 3.9 | 22.8 | 22.0 | 20.7 | 2.18 | 65 | 40 | 2.5 | 4.0 | 21.5 | 20.8 | 19.7 | 0.13 | 10 | 7 | 0.1 | 0.1 | -1.3 | -1.2 | -1.0 |
| 5.5 | 2005 | 112-02 | 2.23 | 67 | 45 | 2.8 | 4.1 | 20.0 | 19.2 | 18.2 | 2.36 | 75 | 52 | 3.0 | 4.2 | 18.5 | 18.0 | 17.2 | 0.13 | 8 | 7 | 0.2 | 0.0 | -1.5 | -1.2 | -1.0 |
| 5.5 | 2004 | 112-12 | 2.33 | 71 | 51 | 3.2 | 4.2 | 17.9 | 17.1 | 16.3 | 2.42 | 76 | 56 | 3.3 | 4.3 | 16.8 | 16.1 | 15.5 | 0.09 | 5 | 5 | 0.2 | 0.0 | -1.1 | -1.0 | -0.8 |
| 5.5 | 2003 | 112-12 | 2.36 | 71 | 54 | 3.3 | 4.2 | 16.8 | 16.1 | 15.4 | 2.44 | 76 | 59 | 3.5 | 4.2 | 15.7 | 15.2 | 14.7 | 0.09 | 4 | 5 | 0.2 | 0.0 | -1.1 | -0.9 | -0.7 |
| 6.0 | TBA | 113-08+ | 1.21 | -4 | -18 | 1.3 | 3.3 | 29.5 | 28.4 | 27.2 | 1.59 | 26 | 6 | 1.7 | 3.5 | 26.4 | 25.7 | 24.7 | 0.39 | 30 | 24 | 0.4 | 0.2 | -3.1 | -2.7 | -2.5 |
| 6.0 | 2008 | 113-08+ | 2.17 | 65 | 46 | 2.4 | 3.9 | 23.1 | 22.0 | 20.8 | 2.28 | 75 | 53 | 2.5 | 4.0 | 21.9 | 21.1 | 20.0 | 0.11 | 10 | 7 | 0.2 | 0.1 | -1.2 | -0.9 | -0.8 |
| 6.0 | 2007 | 113-08+ | 2.01 | 53 | 35 | 2.2 | 3.8 | 24.0 | 23.0 | 21.7 | 2.19 | 67 | 47 | 2.5 | 3.9 | 22.2 | 21.5 | 20.5 | 0.18 | 15 | 12 | 0.3 | 0.1 | -1.8 | -1.5 | -1.2 |
| 6.0 | 2006 | 113-08+ | 2.18 | 64 | 47 | 2.5 | 3.9 | 22.2 | 21.4 | 20.2 | 2.33 | 77 | 57 | 2.7 | 4.0 | 20.6 | 20.1 | 19.1 | 0.16 | 12 | 11 | 0.2 | 0.1 | -1.6 | -1.3 | -1.1 |
| 6.5 | TBA | 114-16 | 1.16 | -13 | -22 | 1.3 | 3.1 | 29.6 | 28.8 | 27.9 | 1.76 | 35 | 19 | 1.8 | 3.4 | 25.5 | 25.1 | 24.3 | 0.60 | 48 | 41 | 0.5 | 0.3 | -4.1 | -3.7 | -3.6 |
| 6.5 | 2008 | 114-16 | 2.51 | 92 | 77 | 2.8 | 4.0 | 21.2 | 20.5 | 19.4 | 2.53 | 95 | 78 | 2.8 | 4.0 | 20.7 | 20.2 | 19.4 | 0.02 | 3 | 1 | 0.0 | 0.0 | -0.5 | -0.3 | 0.0 |
| 6.5 | 2007 | 114-16 | 2.33 | 75 | 63 | 2.7 | 3.8 | 22.1 | 21.4 | 20.5 | 2.52 | 90 | 76 | 2.9 | 3.9 | 20.1 | 19.8 | 19.2 | 0.19 | 15 | 14 | 0.2 | 0.1 | -2.0 | -1.6 | -1.3 |
| 6.5 | 2006 | 114-16 | 2.42 | 83 | 70 | 2.8 | 3.8 | 21.0 | 20.4 | 19.5 | 2.59 | 96 | 82 | 3.0 | 3.9 | 19.2 | 19.0 | 18.4 | 0.17 | 13 | 12 | 0.2 | 0.1 | -1.8 | -1.4 | -1.1 |

Source: Barclays Research

FIGURE 31

**IOS, Market Rates: NY 3PM Close of Fri, Nov 06, 2015**

| | | | Prod V1.36.4 | | | | | | | | Beta V1.37 | | | | | | | | Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Security | Coupon | Price | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life |
| IFN-33012 | 3.0 | 20-12+ | 3.26 | 269 | 137 | -8.0 | 5.5 | 6.6 | 6.6 | 7.2 | 2.31 | 220 | 28 | -13.2 | 5.6 | 7.3 | 7.3 | 8.1 | -0.96 | -49 | -108 | -5.2 | 0.1 | 0.7 | 0.7 | 0.9 |
| IFN-33013 | 3.0 | 20-26+ | 3.13 | 253 | 124 | -7.8 | 5.7 | 6.4 | 6.6 | 7.2 | 2.20 | 204 | 18 | -12.9 | 5.7 | 7.1 | 7.3 | 8.1 | -0.93 | -49 | -106 | -5.1 | 0.1 | 0.7 | 0.7 | 0.9 |
| IFN-33510 | 3.5 | 20-04+ | 1.86 | 336 | 133 | -17.7 | 4.9 | 10.8 | 10.3 | 10.7 | 0.37 | 267 | -3 | -23.6 | 5.1 | 12.3 | 11.8 | 12.0 | -1.49 | -69 | -136 | -6.0 | 0.1 | 1.5 | 1.5 | 1.3 |
| IFN-33512 | 3.5 | 21-22+ | 2.89 | 308 | 169 | -11.8 | 5.2 | 8.7 | 8.6 | 9.0 | 1.52 | 248 | 47 | -17.2 | 5.4 | 9.9 | 9.9 | 10.3 | -1.38 | -60 | -122 | -5.5 | 0.1 | 1.2 | 1.3 | 1.3 |
| IFN-33513 | 3.5 | 21-29+ | 3.07 | 322 | 181 | -11.9 | 5.3 | 8.4 | 8.6 | 9.0 | 1.66 | 255 | 57 | -17.5 | 5.5 | 9.7 | 9.9 | 10.3 | -1.42 | -67 | -124 | -5.6 | 0.1 | 1.3 | 1.3 | 1.3 |
| IFN-33514 | 3.5 | 20-28 | 1.35 | 407 | 140 | -25.1 | 5.3 | 11.6 | 11.1 | 11.7 | -0.45 | 350 | 7 | -33.4 | 5.5 | 13.4 | 13.2 | 13.3 | -1.80 | -57 | -133 | -8.3 | 0.2 | 1.8 | 2.1 | 1.6 |
| IFN-34009 | 4.0 | 20-03+ | 0.79 | 350 | 130 | -22.7 | 4.5 | 15.2 | 13.9 | 13.7 | -0.09 | 298 | 21 | -26.3 | 4.6 | 16.0 | 14.7 | 14.5 | -0.88 | -52 | -110 | -3.6 | 0.1 | 0.8 | 0.8 | 0.8 |
| IFN-34010 | 4.0 | 21-21 | 1.56 | 312 | 144 | -18.5 | 4.8 | 13.4 | 12.5 | 12.1 | 0.73 | 254 | 38 | -22.1 | 4.9 | 14.4 | 13.4 | 12.8 | -0.82 | -58 | -106 | -3.6 | 0.1 | 1.0 | 0.9 | 0.7 |
| IFN-34011 | 4.0 | 22-05+ | 1.75 | 314 | 157 | -17.8 | 5.0 | 13.1 | 12.3 | 11.8 | 1.01 | 260 | 61 | -20.8 | 5.0 | 13.9 | 13.0 | 12.4 | -0.74 | -54 | -96 | -3.0 | 0.1 | 0.8 | 0.7 | 0.6 |
| IFN-34013 | 4.0 | 21-17 | 1.23 | 362 | 185 | -22.2 | 5.0 | 15.4 | 14.2 | 13.3 | 0.26 | 289 | 81 | -25.6 | 5.1 | 16.7 | 15.2 | 14.1 | -0.97 | -73 | -105 | -3.4 | 0.1 | 1.3 | 1.0 | 0.8 |
| IFN-34014 | 4.0 | 21-28+ | 1.31 | 389 | 200 | -22.7 | 5.1 | 14.3 | 13.7 | 13.1 | -0.18 | 305 | 65 | -29.0 | 5.2 | 16.6 | 15.5 | 14.5 | -1.49 | -83 | -135 | -6.4 | 0.2 | 2.3 | 1.8 | 1.4 |
| IFN-34509 | 4.5 | 20-23+ | -0.46 | 324 | 146 | -25.2 | 4.4 | 19.1 | 17.4 | 16.6 | -0.49 | 326 | 98 | -26.2 | 4.4 | 18.5 | 17.2 | 16.6 | -0.03 | 3 | -48 | -1.0 | 0.0 | -0.6 | -0.2 | 0.0 |
| IFN-34510 | 4.5 | 22-03 | 1.11 | 315 | 187 | -19.5 | 4.6 | 16.3 | 15.1 | 14.3 | 0.31 | 275 | 95 | -22.9 | 4.6 | 16.7 | 15.7 | 15.0 | -0.79 | -39 | -92 | -3.4 | 0.0 | 0.4 | 0.6 | 0.7 |
| IFN-34511 | 4.5 | 23-04 | 1.31 | 290 | 164 | -18.3 | 4.7 | 15.4 | 14.4 | 13.5 | 0.48 | 243 | 69 | -21.7 | 4.8 | 16.0 | 15.1 | 14.3 | -0.83 | -47 | -94 | -3.4 | 0.1 | 0.6 | 0.7 | 0.8 |
| IFN-35003 | 5.0 | 22-04+ | -0.52 | 88 | 16 | -10.4 | 3.9 | 16.9 | 15.9 | 15.1 | -0.12 | 96 | 12 | -8.9 | 3.8 | 16.1 | 15.4 | 14.8 | 0.40 | 9 | -5 | 1.5 | 0.0 | -0.8 | -0.5 | -0.3 |
| IFN-35005 | 5.0 | 21-22+ | -3.77 | -83 | -115 | -17.5 | 4.1 | 22.0 | 21.0 | 19.7 | -2.59 | -8 | -79 | -15.6 | 4.1 | 20.3 | 19.6 | 18.6 | 1.18 | 75 | 36 | 1.9 | -0.1 | -1.7 | -1.4 | -1.1 |
| IFN-35008 | 5.0 | 22-02 | -5.76 | -158 | -165 | -22.9 | 4.4 | 24.2 | 23.1 | 22.1 | -5.19 | -111 | -173 | -22.5 | 4.4 | 23.3 | 22.4 | 21.5 | 0.58 | 47 | -9 | 0.4 | -0.1 | -0.9 | -0.7 | -0.6 |
| IFN-35009 | 5.0 | 21-31 | -0.61 | 284 | 186 | -20.6 | 4.2 | 20.1 | 18.9 | 17.9 | -1.57 | 252 | 102 | -22.8 | 4.3 | 20.7 | 19.6 | 18.7 | -0.95 | -32 | -84 | -2.3 | 0.0 | 0.6 | 0.7 | 0.8 |
| IFN-35010 | 5.0 | 22-26 | 0.89 | 325 | 242 | -17.1 | 4.3 | 17.7 | 16.9 | 16.0 | -0.86 | 251 | 112 | -21.3 | 4.4 | 19.3 | 18.4 | 17.6 | -1.75 | -74 | -130 | -4.3 | 0.1 | 1.6 | 1.5 | 1.6 |
| IFN-35503 | 5.5 | 23-06 | 0.11 | 87 | 73 | -7.7 | 3.7 | 17.3 | 16.5 | 15.8 | 0.86 | 127 | 94 | -6.2 | 3.7 | 16.2 | 15.7 | 15.1 | 0.75 | 40 | 21 | 1.5 | 0.0 | -1.1 | -0.8 | -0.7 |
| IFN-35505 | 5.5 | 24-03 | -3.04 | -138 | -128 | -13.4 | 4.1 | 20.8 | 20.0 | 18.9 | -1.83 | -54 | -80 | -11.5 | 4.0 | 19.2 | 18.7 | 17.8 | 1.21 | 84 | 48 | 1.9 | -0.1 | -1.6 | -1.3 | -1.1 |
| IFN-35508 | 5.5 | 21-29 | -3.43 | -84 | -4 | -19.1 | 4.1 | 24.7 | 23.5 | 22.2 | -2.02 | 38 | 52 | -17.6 | 4.0 | 23.0 | 22.0 | 21.0 | 1.41 | 122 | 56 | 1.5 | -0.1 | -1.7 | -1.5 | -1.2 |
| IFN-36008 | 6.0 | 23-09+ | -2.33 | -109 | 1 | -15.3 | 4.0 | 24.7 | 23.4 | 22.0 | -1.22 | 4 | 63 | -13.8 | 3.9 | 23.1 | 22.1 | 21.0 | 1.11 | 113 | 61 | 1.4 | -0.1 | -1.6 | -1.3 | -1.0 |
| IFN-36567 | 6.5 | 26-13+ | -3.04 | -275 | -187 | -10.3 | 4.0 | 23.2 | 22.4 | 21.3 | -1.44 | -130 | -80 | -8.5 | 3.9 | 21.1 | 20.6 | 19.9 | 1.60 | 145 | 107 | 1.8 | -0.1 | -2.1 | -1.8 | -1.4 |
| IG2-34010 | 4.0 | 19-31+ | 0.61 | 108 | 54 | -19.0 | 4.9 | 17.5 | 17.0 | 14.3 | -0.70 | 226 | 66 | -22.9 | 4.9 | 18.4 | 17.5 | 15.6 | -1.31 | 118 | 12 | -3.9 | 0.0 | 0.9 | 0.5 | 1.3 |
| IG2-34510 | 4.5 | 20-07+ | 0.00 | 130 | 82 | -21.3 | 4.7 | 22.4 | 20.6 | 17.0 | 0.01 | 161 | 138 | -19.9 | 4.6 | 21.4 | 19.4 | 17.0 | 0.01 | 31 | 55 | 1.4 | -0.1 | -1.0 | -1.2 | 0.0 |
| IG2-35010 | 5.0 | 21-27+ | 0.75 | 188 | 147 | -17.1 | 4.6 | 22.3 | 20.4 | 16.9 | 1.38 | 173 | 200 | -15.5 | 4.4 | 19.7 | 18.4 | 16.3 | 0.63 | -14 | 54 | 1.6 | -0.1 | -2.6 | -2.0 | -0.6 |

Source: Barclays Research

FIGURE 32

**FN 15Y, Market Rates: NY 3PM Close of Fri, Nov 06, 2015**

| | | | Prod V1.36.4 | | | | | | | | Beta V1.37 | | | | | | | | Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coupon | Vintage | Price | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life |
| 2.5 | TBA | 101-05 | 2.26 | 29 | 16 | 5.0 | 5.1 | 4.0 | 5.9 | 7.2 | 2.26 | 28 | 13 | 4.8 | 5.1 | 3.8 | 5.9 | 7.1 | 0.00 | -1 | -4 | -0.2 | 0.0 | -0.2 | 0.0 | -0.1 |
| 2.5 | 2014 | 101-05 | 2.23 | 32 | 20 | 4.5 | 4.7 | 6.9 | 7.7 | 8.5 | 2.23 | 31 | 16 | 4.4 | 4.6 | 7.1 | 7.8 | 8.4 | 0.00 | -1 | -4 | -0.1 | 0.0 | 0.2 | 0.1 | -0.1 |
| 2.5 | 2013 | 101-09 | 2.17 | 34 | 28 | 4.2 | 4.3 | 7.6 | 8.1 | 8.8 | 2.18 | 34 | 27 | 4.2 | 4.3 | 7.3 | 7.7 | 8.5 | 0.00 | 0 | -1 | 0.0 | 0.0 | -0.3 | -0.4 | -0.3 |
| 2.5 | 2012 | 101-13 | 2.12 | 34 | 28 | 4.0 | 4.0 | 8.1 | 8.6 | 9.2 | 2.13 | 33 | 26 | 3.9 | 4.1 | 7.8 | 8.1 | 8.9 | 0.00 | 0 | -2 | 0.0 | 0.0 | -0.3 | -0.5 | -0.3 |
| 3.0 | TBA | 103-15 | 2.17 | 33 | 14 | 3.9 | 4.4 | 10.2 | 10.1 | 10.3 | 2.15 | 32 | 10 | 3.6 | 4.3 | 11.4 | 10.9 | 10.9 | -0.02 | 0 | -4 | -0.3 | -0.1 | 1.2 | 0.8 | 0.6 |
| 3.0 | 2014 | 103-15 | 2.19 | 33 | 20 | 4.1 | 4.5 | 8.6 | 9.0 | 9.5 | 2.19 | 33 | 17 | 3.9 | 4.4 | 9.3 | 9.3 | 9.7 | 0.00 | 0 | -3 | -0.2 | 0.0 | 0.7 | 0.3 | 0.2 |
| 3.0 | 2013 | 103-17 | 2.13 | 32 | 22 | 4.0 | 4.2 | 8.8 | 9.2 | 9.7 | 2.14 | 32 | 21 | 4.0 | 4.2 | 8.7 | 8.9 | 9.6 | 0.00 | 0 | -1 | -0.1 | 0.0 | -0.1 | -0.3 | -0.1 |
| 3.0 | 2012 | 103-18 | 2.04 | 30 | 24 | 3.7 | 3.9 | 9.4 | 9.8 | 10.3 | 2.04 | 30 | 23 | 3.7 | 3.9 | 9.0 | 9.6 | 10.2 | 0.00 | 1 | -1 | -0.1 | 0.0 | -0.4 | -0.2 | -0.1 |
| 3.0 | 2011 | 103-19 | 1.98 | 28 | 21 | 3.5 | 3.7 | 10.0 | 10.4 | 10.8 | 1.99 | 29 | 20 | 3.4 | 3.7 | 9.6 | 9.9 | 10.5 | 0.01 | 1 | -2 | -0.1 | 0.0 | -0.4 | -0.5 | -0.3 |
| 3.5 | TBA | 105-05+ | 1.87 | 27 | 19 | 2.9 | 3.3 | 13.3 | 12.9 | 13.0 | 1.88 | 29 | 18 | 2.8 | 3.3 | 12.7 | 12.3 | 12.6 | 0.02 | 2 | -1 | -0.1 | 0.0 | -0.6 | -0.6 | -0.4 |
| 3.5 | 2014 | 105-05+ | 2.27 | 45 | 33 | 4.1 | 4.4 | 9.4 | 9.8 | 10.2 | 2.27 | 45 | 33 | 4.0 | 4.3 | 9.2 | 9.6 | 10.2 | 0.00 | 0 | -1 | -0.1 | 0.0 | -0.2 | -0.2 | 0.0 |
| 3.5 | 2013 | 105-05+ | 2.21 | 42 | 32 | 3.9 | 4.2 | 10.1 | 10.2 | 10.6 | 2.22 | 43 | 33 | 3.9 | 4.1 | 9.6 | 9.8 | 10.4 | 0.01 | 1 | 1 | 0.0 | 0.0 | -0.5 | -0.4 | -0.2 |
| 3.5 | 2012 | 105-09+ | 2.05 | 33 | 28 | 3.6 | 3.8 | 10.1 | 10.4 | 10.8 | 2.05 | 34 | 28 | 3.6 | 3.7 | 9.8 | 10.4 | 10.9 | 0.00 | 0 | 0 | 0.0 | 0.0 | -0.3 | 0.0 | 0.1 |
| 3.5 | 2011 | 105-11+ | 1.92 | 27 | 20 | 3.2 | 3.5 | 11.3 | 11.5 | 11.8 | 1.92 | 28 | 19 | 3.1 | 3.5 | 10.9 | 11.4 | 11.7 | 0.00 | 1 | -1 | -0.1 | 0.0 | -0.4 | -0.1 | -0.1 |
| 3.5 | 2010 | 105-09+ | 1.83 | 23 | 17 | 3.0 | 3.3 | 12.0 | 12.3 | 12.4 | 1.83 | 24 | 16 | 2.9 | 3.3 | 11.6 | 12.1 | 12.3 | 0.00 | 1 | -1 | -0.1 | 0.0 | -0.4 | -0.2 | -0.1 |
| 4.0 | TBA | 104-20 | 0.21 | -68 | -69 | 1.2 | 1.3 | 14.2 | | 13.9 | 0.17 | -71 | -73 | 1.2 | 1.3 | 15.3 | | 15.0 | -0.04 | -3 | -4 | 0.0 | 0.0 | 1.1 | | 1.1 |
| 4.0 | 2011 | 105-06 | 2.39 | 77 | 70 | 3.1 | 3.3 | 12.3 | 12.3 | 12.5 | 2.38 | 77 | 68 | 3.0 | 3.3 | 12.2 | 12.4 | 12.7 | -0.01 | 0 | -1 | -0.1 | 0.0 | -0.1 | 0.1 | 0.2 |
| 4.0 | 2010 | 105-04 | 2.29 | 72 | 67 | 2.9 | 3.1 | 13.0 | 13.0 | 13.1 | 2.28 | 72 | 65 | 2.8 | 3.1 | 13.0 | 13.2 | 13.4 | -0.01 | 0 | -2 | -0.1 | 0.0 | 0.0 | 0.2 | 0.3 |
| 4.0 | 2009 | 105-04 | 2.12 | 63 | 58 | 2.6 | 2.8 | 14.1 | 14.1 | 14.1 | 2.10 | 63 | 55 | 2.5 | 2.8 | 14.3 | 14.4 | 14.5 | -0.02 | 0 | -3 | -0.1 | 0.0 | 0.2 | 0.3 | 0.4 |
| 4.5 | TBA | 104-05 | 1.02 | 12 | 11 | 1.2 | 1.3 | 14.3 | | 14.1 | 0.98 | 8 | 7 | 1.2 | 1.3 | 15.6 | | 15.3 | -0.04 | -3 | -4 | 0.0 | 0.0 | 1.3 | | 1.2 |
| 4.5 | 2010 | 105-21 | 2.56 | 102 | 96 | 2.8 | 3.0 | 13.4 | 13.7 | 13.7 | 2.54 | 101 | 94 | 2.7 | 3.0 | 13.5 | 13.9 | 14.1 | -0.02 | -1 | -2 | -0.1 | 0.0 | 0.1 | 0.2 | 0.4 |
| 4.5 | 2009 | 105-21 | 2.41 | 93 | 88 | 2.5 | 2.8 | 14.2 | 14.5 | 14.4 | 2.39 | 92 | 86 | 2.5 | 2.8 | 14.4 | 14.9 | 14.9 | -0.02 | -1 | -2 | -0.1 | 0.0 | 0.2 | 0.4 | 0.5 |

Source: Barclays Research

FIGURE 33

**FN 20Y, Market Rates: NY 3PM Close of Fri, Nov 06, 2015**

| | | | Prod V1.36.4 | | | | | | | | Beta V1.37 | | | | | | | | Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coupon | Vintage | Price | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life |
| 3.0 | TBA | 101-30+ | 2.63 | 56 | 23 | 5.2 | 5.8 | 4.9 | 6.3 | 9.0 | 2.63 | 55 | 19 | 4.9 | 5.7 | 4.8 | 7.0 | 9.4 | -0.01 | 0 | -5 | -0.2 | -0.1 | -0.1 | 0.7 | 0.4 |
| 3.0 | 2014 | 101-30+ | 2.58 | 57 | 24 | 4.8 | 5.3 | 8.3 | 8.9 | 11.1 | 2.57 | 56 | 19 | 4.5 | 5.1 | 10.0 | 10.2 | 11.7 | -0.01 | -1 | -5 | -0.3 | -0.2 | 1.7 | 1.3 | 0.6 |
| 3.0 | 2013 | 101-30+ | 2.61 | 60 | 40 | 5.1 | 5.3 | 6.5 | 7.1 | 8.4 | 2.61 | 59 | 39 | 5.1 | 5.3 | 6.4 | 7.1 | 8.4 | 0.00 | 0 | -1 | 0.0 | 0.0 | -0.1 | 0.0 | 0.0 |
| 3.0 | 2012 | 101-30+ | 2.59 | 61 | 40 | 4.8 | 5.1 | 6.7 | 8.1 | 9.2 | 2.59 | 60 | 38 | 4.7 | 5.0 | 6.6 | 8.3 | 9.2 | 0.00 | -1 | -3 | -0.1 | 0.0 | -0.1 | 0.2 | 0.0 |
| 3.5 | TBA | 104-11 | 2.68 | 68 | 36 | 4.9 | 5.6 | 6.6 | 8.2 | 9.7 | 2.66 | 68 | 32 | 4.6 | 5.5 | 6.4 | 9.1 | 10.1 | -0.02 | 0 | -4 | -0.2 | -0.1 | -0.2 | 0.9 | 0.4 |
| 3.5 | 2014 | 104-11 | 2.49 | 64 | 26 | 4.0 | 4.9 | 13.3 | 12.9 | 13.4 | 2.48 | 63 | 22 | 3.7 | 4.8 | 14.8 | 13.8 | 13.6 | -0.01 | -1 | -4 | -0.3 | -0.1 | 1.5 | 0.9 | 0.2 |
| 3.5 | 2013 | 104-11 | 2.60 | 66 | 41 | 4.6 | 5.1 | 9.1 | 9.5 | 10.3 | 2.60 | 66 | 41 | 4.5 | 5.1 | 9.6 | 9.7 | 10.2 | 0.00 | 0 | 0 | -0.1 | 0.0 | 0.5 | 0.2 | -0.1 |
| 3.5 | 2012 | 104-27 | 2.41 | 56 | 31 | 4.1 | 4.8 | 9.5 | 11.3 | 11.3 | 2.42 | 56 | 29 | 4.0 | 4.8 | 9.8 | 11.2 | 11.1 | 0.01 | 0 | -2 | -0.1 | 0.0 | 0.3 | -0.1 | -0.2 |
| 3.5 | 2011 | 104-11 | 2.42 | 63 | 36 | 3.7 | 4.4 | 11.6 | 13.9 | 13.2 | 2.45 | 64 | 35 | 3.7 | 4.5 | 11.7 | 13.2 | 12.5 | 0.03 | 0 | -1 | 0.0 | 0.0 | 0.1 | -0.7 | -0.7 |
| 3.5 | 2010 | 104-11 | 2.37 | 60 | 38 | 3.5 | 4.2 | 15.1 | 14.5 | 13.7 | 2.41 | 61 | 37 | 3.5 | 4.2 | 14.1 | 13.4 | 12.8 | 0.04 | 1 | -1 | 0.0 | 0.1 | -1.0 | -1.1 | -0.9 |
| 4.0 | TBA | 106-28+ | 2.53 | 67 | 35 | 4.0 | 5.0 | 12.4 | 11.8 | 12.1 | 2.55 | 67 | 35 | 3.9 | 5.0 | 12.3 | 11.7 | 11.7 | 0.02 | 1 | 0 | -0.1 | 0.0 | -0.1 | -0.1 | -0.4 |
| 4.0 | 2014 | 106-28+ | 2.52 | 66 | 35 | 4.0 | 5.0 | 12.3 | 11.8 | 12.1 | 2.54 | 67 | 36 | 3.9 | 5.0 | 12.4 | 11.7 | 11.8 | 0.02 | 1 | 0 | -0.1 | 0.0 | 0.1 | -0.1 | -0.3 |
| 4.0 | 2013 | 106-28+ | 2.47 | 63 | 35 | 3.9 | 4.8 | 13.0 | 12.3 | 12.4 | 2.52 | 65 | 38 | 4.0 | 4.9 | 12.2 | 11.5 | 11.7 | 0.05 | 2 | 3 | 0.1 | 0.1 | -0.8 | -0.8 | -0.7 |
| 4.0 | 2012 | 107-12+ | 2.38 | 54 | 33 | 4.1 | 4.7 | 10.4 | 11.0 | 11.1 | 2.41 | 55 | 34 | 4.2 | 4.8 | 9.9 | 10.4 | 10.7 | 0.03 | 1 | 1 | 0.0 | 0.0 | -0.5 | -0.6 | -0.4 |
| 4.0 | 2011 | 107-04+ | 2.22 | 49 | 24 | 3.3 | 4.3 | 14.5 | 14.6 | 13.7 | 2.29 | 53 | 26 | 3.4 | 4.4 | 13.3 | 13.3 | 12.8 | 0.06 | 3 | 2 | 0.1 | 0.1 | -1.2 | -1.3 | -0.9 |
| 4.0 | 2010 | 106-28+ | 2.18 | 49 | 26 | 3.1 | 4.1 | 16.5 | 15.2 | 14.4 | 2.25 | 53 | 28 | 3.1 | 4.2 | 15.0 | 13.9 | 13.4 | 0.07 | 4 | 2 | 0.0 | 0.1 | -1.5 | -1.3 | -1.0 |
| 4.0 | 2009 | 106-28+ | 2.16 | 46 | 30 | 3.2 | 3.9 | 14.5 | 13.4 | 13.4 | 2.20 | 49 | 31 | 3.2 | 4.0 | 13.6 | 12.6 | 12.8 | 0.04 | 3 | 1 | 0.0 | 0.1 | -0.9 | -0.8 | -0.6 |
| 4.5 | TBA | 108-04 | 2.79 | 93 | 69 | 4.3 | 5.0 | 10.2 | 10.9 | 12.1 | 2.86 | 97 | 75 | 4.8 | 5.2 | 8.1 | 9.7 | 11.2 | 0.08 | 4 | 7 | 0.4 | 0.2 | -2.1 | -1.2 | -0.9 |
| 4.5 | 2011 | 109-04 | 2.12 | 50 | 23 | 2.9 | 4.1 | 16.0 | 15.8 | 14.9 | 2.20 | 55 | 28 | 3.0 | 4.2 | 14.6 | 14.6 | 14.1 | 0.07 | 5 | 4 | 0.1 | 0.1 | -1.4 | -1.2 | -0.8 |
| 4.5 | 2010 | 108-04 | 2.25 | 63 | 40 | 2.8 | 3.9 | 18.1 | 16.2 | 15.5 | 2.32 | 69 | 45 | 2.9 | 4.0 | 16.3 | 14.9 | 14.6 | 0.07 | 5 | 5 | 0.1 | 0.1 | -1.8 | -1.3 | -0.9 |
| 4.5 | 2009 | 108-04 | 2.28 | 63 | 44 | 3.0 | 3.8 | 15.7 | 14.4 | 14.3 | 2.32 | 67 | 47 | 3.0 | 3.9 | 14.5 | 13.6 | 13.7 | 0.04 | 4 | 3 | 0.1 | 0.1 | -1.2 | -0.8 | -0.6 |
| 5.0 | TBA | 110-06 | 1.74 | 35 | 17 | 2.4 | 3.4 | 19.2 | 18.8 | 18.8 | 1.86 | 42 | 24 | 2.6 | 3.5 | 17.4 | 17.3 | 17.5 | 0.13 | 8 | 8 | 0.2 | 0.1 | -1.8 | -1.5 | -1.3 |
| 5.0 | 2003 | 110-06 | 0.96 | -33 | -39 | 2.0 | 2.6 | 16.4 | 16.4 | 16.2 | 0.94 | -35 | -42 | 2.1 | 2.6 | 16.3 | 16.6 | 16.4 | -0.02 | -3 | -3 | 0.0 | 0.0 | -0.1 | 0.2 | 0.2 |
| 5.5 | TBA | 111-28+ | 1.65 | 28 | 14 | 2.3 | 3.4 | 19.9 | 19.4 | 19.3 | 1.81 | 39 | 24 | 2.5 | 3.5 | 18.0 | 17.7 | 18.0 | 0.16 | 10 | 10 | 0.2 | 0.1 | -1.9 | -1.7 | -1.3 |
| 5.5 | 2003 | 111-28+ | 0.71 | -57 | -61 | 2.0 | 2.6 | 17.4 | 17.3 | 17.1 | 0.74 | -56 | -60 | 2.1 | 2.6 | 16.8 | 16.9 | 16.8 | 0.03 | 2 | 1 | 0.1 | 0.0 | -0.6 | -0.4 | -0.3 |

Source: Barclays Research

FIGURE 34

**GN2 30Y, Market Rates: NY 3PM Close of Fri, Nov 06, 2015**

| | | | Prod V1.36.4 | | | | | | | | Beta V1.37 | | | | | | | | Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coupon | Vintage | Price | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life |
| 3.0 | TBA | 101-17+ | 2.74 | 55 | 20 | 5.7 | 6.3 | 6.2 | 8.8 | 10.2 | 2.75 | 53 | 16 | 5.6 | 6.4 | 4.8 | 7.5 | 9.5 | 0.01 | -2 | -5 | -0.1 | 0.1 | -1.4 | -1.3 | -0.7 |
| 3.0 | 2013 | 101-25+ | 2.66 | 52 | 20 | 5.6 | 5.8 | 12.6 | 12.6 | 11.4 | 2.66 | 50 | 16 | 5.7 | 5.9 | 10.9 | 11.8 | 11.3 | 0.00 | -2 | -4 | 0.1 | 0.2 | -1.7 | -0.8 | -0.1 |
| 3.0 | 2012 | 101-30+ | 2.62 | 50 | 17 | 5.4 | 5.6 | 13.8 | 13.5 | 11.9 | 2.62 | 48 | 14 | 5.5 | 5.8 | 13.2 | 13.0 | 12.0 | 0.00 | -2 | -3 | 0.1 | 0.2 | -0.6 | -0.5 | 0.1 |
| 3.5 | TBA | 104-09 | 2.63 | 65 | 18 | 4.5 | 5.5 | 10.9 | 13.3 | 13.7 | 2.67 | 66 | 14 | 4.0 | 5.7 | 9.2 | 11.2 | 13.1 | 0.03 | 1 | -5 | -0.5 | 0.1 | -1.7 | -2.1 | -0.6 |
| 3.5 | 2014 | 104-11 | 2.53 | 58 | 13 | 4.1 | 5.1 | 18.0 | 17.1 | 15.1 | 2.56 | 59 | 9 | 3.7 | 5.2 | 18.0 | 15.5 | 14.5 | 0.03 | 2 | -4 | -0.4 | 0.1 | 0.0 | -1.6 | -0.6 |
| 3.5 | 2013 | 104-15 | 2.59 | 57 | 18 | 4.6 | 5.3 | 15.4 | 14.9 | 13.2 | 2.57 | 60 | 17 | 4.8 | 5.5 | 12.8 | 14.4 | 13.7 | -0.02 | 3 | -2 | 0.2 | 0.2 | -2.6 | -0.5 | 0.5 |
| 3.5 | 2012 | 104-19+ | 2.52 | 53 | 14 | 4.4 | 5.2 | 16.6 | 15.9 | 13.7 | 2.49 | 55 | 13 | 4.5 | 5.3 | 16.6 | 15.9 | 14.4 | -0.03 | 2 | -1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.7 |
| 3.5 | 2011 | 104-22 | 2.45 | 49 | 12 | 4.2 | 5.0 | 18.7 | 17.5 | 14.6 | 2.47 | 52 | 12 | 4.4 | 5.2 | 17.4 | 16.1 | 14.5 | 0.01 | 2 | 0 | 0.2 | 0.2 | -1.3 | -1.4 | -0.1 |
| 4.0 | TBA | 106-08+ | 2.37 | 61 | 16 | 3.3 | 4.6 | 23.6 | 21.0 | 18.5 | 2.46 | 67 | 16 | 2.9 | 4.7 | 23.1 | 19.3 | 17.3 | 0.09 | 5 | 0 | -0.4 | 0.1 | -0.5 | -1.7 | -1.2 |
| 4.0 | 2014 | 106-08+ | 2.47 | 65 | 22 | 3.6 | 4.8 | 22.2 | 19.8 | 16.9 | 2.55 | 69 | 21 | 3.3 | 4.9 | 20.7 | 17.8 | 16.0 | 0.07 | 5 | 0 | -0.2 | 0.1 | -1.5 | -2.0 | -0.9 |
| 4.0 | 2013 | 106-11+ | 2.36 | 58 | 14 | 3.3 | 4.6 | 23.8 | 21.7 | 18.1 | 2.49 | 65 | 18 | 3.4 | 4.8 | 20.1 | 18.4 | 16.5 | 0.13 | 7 | 3 | 0.1 | 0.2 | -3.7 | -3.3 | -1.6 |
| 4.0 | 2012 | 106-15 | 2.65 | 68 | 34 | 4.3 | 5.2 | 17.6 | 16.3 | 13.4 | 2.62 | 69 | 33 | 4.5 | 5.3 | 16.8 | 15.7 | 14.0 | -0.03 | 0 | -1 | 0.2 | 0.0 | -0.8 | -0.6 | 0.6 |
| 4.0 | 2011 | 106-28+ | 2.39 | 52 | 15 | 3.6 | 4.8 | 21.2 | 19.4 | 15.7 | 2.44 | 55 | 17 | 3.9 | 4.9 | 18.3 | 17.0 | 15.2 | 0.05 | 3 | 2 | 0.3 | 0.1 | -2.9 | -2.4 | -0.5 |
| 4.0 | 2010 | 107-12+ | 2.38 | 47 | 10 | 3.5 | 4.9 | 17.8 | 17.1 | 14.4 | 2.28 | 50 | 7 | 3.5 | 4.9 | 18.6 | 17.7 | 15.8 | -0.10 | 3 | -3 | 0.0 | 0.0 | 0.8 | 0.6 | 1.4 |
| 4.5 | TBA | 107-18 | 2.37 | 71 | 32 | 3.0 | 4.2 | 26.1 | 23.2 | 20.1 | 2.49 | 77 | 36 | 3.0 | 4.4 | 24.0 | 21.2 | 19.0 | 0.11 | 6 | 4 | 0.0 | 0.1 | -2.1 | -2.0 | -1.1 |
| 4.5 | 2014 | 107-18 | 2.52 | 80 | 41 | 3.2 | 4.5 | 24.1 | 21.5 | 18.5 | 2.59 | 83 | 43 | 3.2 | 4.6 | 22.9 | 20.2 | 17.8 | 0.07 | 4 | 2 | 0.0 | 0.1 | -1.2 | -1.3 | -0.7 |
| 4.5 | 2013 | 107-19 | 2.46 | 75 | 37 | 3.2 | 4.4 | 25.1 | 22.2 | 19.0 | 2.55 | 81 | 41 | 3.3 | 4.5 | 22.4 | 20.3 | 18.1 | 0.09 | 6 | 3 | 0.1 | 0.1 | -2.7 | -1.9 | -0.9 |
| 4.5 | 2011 | 108-14 | 2.43 | 66 | 30 | 3.2 | 4.6 | 22.4 | 20.4 | 16.7 | 2.55 | 70 | 36 | 3.6 | 4.8 | 18.6 | 17.6 | 15.6 | 0.12 | 4 | 5 | 0.4 | 0.1 | -3.8 | -2.8 | -1.1 |
| 4.5 | 2010 | 108-30 | 2.33 | 57 | 20 | 2.9 | 4.6 | 21.6 | 20.0 | 16.5 | 2.30 | 57 | 20 | 3.2 | 4.7 | 21.1 | 19.2 | 16.9 | -0.03 | 0 | 0 | 0.3 | 0.1 | -0.5 | -0.8 | 0.4 |
| 4.5 | 2009 | 108-18 | 2.39 | 63 | 27 | 2.9 | 4.5 | 21.9 | 20.1 | 16.5 | 2.32 | 60 | 23 | 3.0 | 4.5 | 22.0 | 19.8 | 17.5 | -0.07 | -2 | -4 | 0.1 | 0.0 | 0.1 | -0.3 | 1.0 |
| 5.0 | TBA | 108-10 | 3.12 | 120 | 103 | 4.3 | 4.7 | 18.0 | 16.7 | 14.3 | 2.85 | 108 | 83 | 3.7 | 4.2 | 19.8 | 19.2 | 17.4 | -0.27 | -13 | -20 | -0.7 | -0.4 | 1.8 | 2.5 | 3.1 |
| 5.0 | 2010 | 110-16 | 2.49 | 75 | 42 | 3.1 | 4.6 | 21.2 | 19.3 | 16.1 | 2.51 | 72 | 41 | 3.2 | 4.6 | 19.3 | 18.1 | 16.1 | 0.02 | -3 | -1 | 0.2 | 0.0 | -1.9 | -1.2 | 0.0 |
| 5.0 | 2009 | 109-24 | 2.59 | 84 | 53 | 3.0 | 4.5 | 22.0 | 20.0 | 16.6 | 2.55 | 79 | 48 | 3.0 | 4.4 | 20.5 | 19.2 | 17.2 | -0.04 | -5 | -5 | 0.0 | -0.1 | -1.5 | -0.8 | 0.6 |
| 5.0 | 2005 | 110-10 | 2.56 | 76 | 56 | 3.6 | 4.5 | 18.0 | 16.6 | 14.5 | 2.57 | 75 | 56 | 3.7 | 4.5 | 17.1 | 16.1 | 14.5 | 0.00 | -1 | 0 | 0.1 | 0.0 | -0.9 | -0.5 | 0.0 |
| 5.0 | 2004 | 110-22 | 2.69 | 80 | 67 | 4.2 | 4.7 | 14.0 | 13.3 | 11.8 | 2.66 | 77 | 65 | 4.3 | 4.7 | 13.8 | 13.2 | 12.1 | -0.02 | -2 | -2 | 0.1 | 0.0 | -0.2 | -0.1 | 0.3 |
| 5.0 | 2003 | 111-02 | 2.62 | 73 | 63 | 4.2 | 4.7 | 13.1 | 12.3 | 11.1 | 2.61 | 71 | 61 | 4.3 | 4.7 | 12.8 | 12.2 | 11.3 | -0.02 | -2 | -2 | 0.1 | 0.0 | -0.3 | -0.1 | 0.2 |
| 5.5 | TBA | 111-05+ | 2.42 | 75 | 54 | 2.9 | 4.0 | 23.7 | 21.9 | 19.2 | 2.44 | 77 | 55 | 3.1 | 4.0 | 21.8 | 20.9 | 19.1 | 0.02 | 1 | 1 | 0.2 | 0.0 | -1.9 | -1.0 | -0.1 |
| 5.5 | 2008 | 111-05+ | 2.43 | 76 | 55 | 2.9 | 4.0 | 23.7 | 21.7 | 19.0 | 2.45 | 77 | 56 | 3.1 | 4.0 | 21.6 | 20.8 | 19.0 | 0.02 | 1 | 2 | 0.2 | 0.0 | -2.1 | -0.9 | 0.0 |
| 5.5 | 2005 | 112-23+ | 2.53 | 73 | 57 | 3.6 | 4.5 | 17.6 | 16.4 | 14.3 | 2.55 | 75 | 58 | 3.7 | 4.5 | 16.6 | 15.8 | 14.2 | 0.02 | 1 | 1 | 0.1 | 0.0 | -1.0 | -0.6 | -0.1 |
| 5.5 | 2004 | 113-17+ | 2.59 | 71 | 60 | 4.2 | 4.7 | 14.1 | 13.3 | 11.9 | 2.59 | 70 | 60 | 4.3 | 4.7 | 13.6 | 13.0 | 11.9 | 0.00 | -1 | 0 | 0.1 | 0.0 | -0.5 | -0.3 | 0.0 |
| 5.5 | 2003 | 113-29+ | 2.50 | 63 | 54 | 4.2 | 4.7 | 13.4 | 12.7 | 11.5 | 2.51 | 63 | 54 | 4.3 | 4.7 | 12.9 | 12.4 | 11.4 | 0.01 | 0 | 1 | 0.1 | 0.0 | -0.5 | -0.3 | -0.1 |
| 6.0 | TBA | 113-04+ | 2.45 | 75 | 60 | 3.1 | 4.0 | 23.0 | 21.4 | 18.9 | 2.44 | 75 | 60 | 3.2 | 4.0 | 21.4 | 20.7 | 19.1 | -0.01 | 0 | 0 | 0.1 | -0.1 | -1.6 | -0.7 | 0.2 |
| 6.0 | 2008 | 113-04+ | 2.47 | 77 | 62 | 3.1 | 4.0 | 22.8 | 21.2 | 18.7 | 2.46 | 77 | 62 | 3.2 | 4.0 | 21.0 | 20.5 | 18.9 | -0.01 | 0 | 0 | 0.1 | -0.1 | -1.8 | -0.7 | 0.2 |
| 6.0 | 2007 | 113-18+ | 2.31 | 62 | 48 | 3.0 | 4.0 | 22.9 | 21.5 | 18.8 | 2.36 | 67 | 52 | 3.2 | 4.0 | 21.1 | 20.4 | 18.5 | 0.06 | 5 | 5 | 0.2 | 0.0 | -1.8 | -1.1 | -0.3 |
| 6.0 | 2006 | 114-00+ | 2.40 | 67 | 53 | 3.2 | 4.1 | 21.0 | 19.6 | 17.2 | 2.45 | 70 | 57 | 3.4 | 4.1 | 19.6 | 18.6 | 16.9 | 0.05 | 4 | 4 | 0.2 | 0.0 | -1.4 | -1.0 | -0.3 |
| 6.0 | 2004 | 115-02+ | 2.73 | 85 | 77 | 4.2 | 4.7 | 14.2 | 13.5 | 12.1 | 2.74 | 85 | 77 | 4.2 | 4.7 | 13.9 | 13.2 | 12.1 | 0.01 | 1 | 1 | 0.1 | 0.0 | -0.3 | -0.3 | 0.0 |
| 6.0 | 2003 | 115-20+ | 2.63 | 75 | 68 | 4.2 | 4.7 | 13.4 | 12.9 | 11.6 | 2.63 | 75 | 68 | 4.3 | 4.7 | 13.2 | 12.6 | 11.7 | 0.00 | -1 | 0 | 0.1 | 0.0 | -0.2 | -0.3 | 0.1 |
| 6.5 | TBA | 114-15+ | 2.76 | 99 | 88 | 3.4 | 4.1 | 21.7 | 19.9 | 17.7 | 2.81 | 103 | 92 | 3.5 | 4.1 | 19.7 | 19.1 | 17.5 | 0.04 | 4 | 4 | 0.1 | 0.0 | -2.0 | -0.8 | -0.2 |
| 6.5 | 2008 | 114-23+ | 2.63 | 87 | 76 | 3.3 | 4.0 | 22.5 | 20.5 | 18.2 | 2.61 | 87 | 76 | 3.4 | 4.0 | 20.4 | 19.9 | 18.4 | -0.02 | 0 | 0 | 0.1 | -0.1 | -2.1 | -0.6 | 0.2 |

Source: Barclays Research

FIGURE 35

**GN 30Y, Market Rates: NY 3PM Close of Fri, Nov 06, 2015**

| | | | Prod V1.36.4 | | | | | | | | Beta V1.37 | | | | | | | | Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coupon | Vintage | Price | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life | Yield | ZV | OAS | OAD | OASD | 1-Yr | 3-Yr | Life |
| 3.0 | TBA | 101-14+ | 2.72 | 59 | 28 | 5.7 | 5.6 | 13.3 | 13.5 | 12.1 | 2.72 | 57 | 21 | 5.6 | 5.7 | 11.7 | 12.9 | 12.3 | 0.00 | -2 | -7 | -0.1 | 0.1 | -1.6 | -0.6 | 0.2 |
| 3.0 | 2013 | 101-22+ | 2.67 | 55 | 24 | 5.7 | 5.7 | 13.6 | 13.5 | 11.8 | 2.67 | 53 | 17 | 5.6 | 5.7 | 13.0 | 13.3 | 12.3 | -0.01 | -2 | -7 | -0.1 | 0.0 | -0.6 | -0.2 | 0.5 |
| 3.0 | 2012 | 101-28+ | 2.65 | 51 | 22 | 5.8 | 5.8 | 13.1 | 13.0 | 11.2 | 2.64 | 50 | 16 | 5.7 | 5.8 | 13.0 | 12.9 | 11.8 | -0.01 | -2 | -6 | -0.1 | 0.0 | -0.1 | -0.1 | 0.6 |
| 3.5 | TBA | 104-03+ | 2.60 | 62 | 26 | 4.7 | 5.0 | 17.3 | 16.8 | 14.5 | 2.59 | 62 | 21 | 4.5 | 5.1 | 17.4 | 16.4 | 14.8 | -0.01 | 1 | -5 | -0.1 | 0.1 | 0.1 | -0.4 | 0.3 |
| 3.5 | 2014 | 104-03+ | 2.72 | 65 | 31 | 5.3 | 5.7 | 13.2 | 13.6 | 12.1 | 2.69 | 65 | 22 | 4.5 | 5.5 | 14.8 | 13.8 | 13.0 | -0.04 | 0 | -9 | -0.7 | -0.2 | 1.6 | 0.2 | 0.9 |
| 3.5 | 2013 | 104-07+ | 2.73 | 63 | 34 | 5.5 | 5.8 | 13.5 | 12.9 | 11.1 | 2.68 | 63 | 27 | 5.2 | 5.7 | 13.1 | 13.6 | 12.4 | -0.05 | 1 | -7 | -0.2 | -0.1 | -0.4 | 0.7 | 1.3 |
| 3.5 | 2012 | 104-11+ | 2.64 | 59 | 28 | 5.0 | 5.4 | 15.6 | 14.9 | 12.5 | 2.59 | 59 | 21 | 4.8 | 5.3 | 16.7 | 15.4 | 13.7 | -0.05 | 0 | -6 | -0.2 | -0.1 | 1.1 | 0.5 | 1.2 |
| 3.5 | 2011 | 104-18+ | 2.54 | 53 | 18 | 4.6 | 5.1 | 17.3 | 16.3 | 13.5 | 2.52 | 54 | 16 | 4.6 | 5.2 | 17.1 | 15.8 | 14.1 | -0.02 | 1 | -3 | 0.0 | 0.1 | -0.2 | -0.5 | 0.6 |
| 4.0 | TBA | 106-07 | 2.46 | 62 | 23 | 3.5 | 4.5 | 22.2 | 20.4 | 16.9 | 2.56 | 68 | 28 | 3.9 | 4.8 | 18.6 | 17.4 | 15.7 | 0.10 | 6 | 5 | 0.4 | 0.3 | -3.6 | -3.0 | -1.2 |
| 4.0 | 2014 | 106-07 | 2.83 | 79 | 48 | 5.0 | 5.6 | 14.9 | 14.2 | 12.0 | 2.77 | 78 | 40 | 4.5 | 5.4 | 15.8 | 14.8 | 13.0 | -0.06 | -1 | -7 | -0.5 | -0.2 | 0.9 | 0.6 | 1.0 |
| 4.0 | 2013 | 106-08+ | 2.85 | 78 | 50 | 5.1 | 5.7 | 14.8 | 13.5 | 11.4 | 2.82 | 79 | 47 | 5.0 | 5.6 | 13.6 | 13.5 | 11.9 | -0.03 | 1 | -3 | -0.1 | 0.0 | -1.2 | 0.0 | 0.5 |
| 4.0 | 2012 | 106-12 | 2.78 | 74 | 46 | 4.9 | 5.4 | 16.0 | 14.3 | 11.9 | 2.76 | 73 | 45 | 5.1 | 5.5 | 15.5 | 14.1 | 12.3 | -0.02 | -1 | -1 | 0.2 | 0.1 | -0.5 | -0.2 | 0.4 |
| 4.0 | 2011 | 106-17 | 2.59 | 64 | 29 | 4.0 | 5.0 | 19.5 | 17.5 | 14.1 | 2.59 | 65 | 30 | 4.3 | 5.0 | 17.2 | 16.0 | 14.3 | 0.00 | 1 | 1 | 0.3 | 0.1 | -2.3 | -1.5 | 0.2 |
| 4.0 | 2010 | 106-31+ | 2.47 | 55 | 21 | 3.9 | 4.9 | 18.1 | 17.1 | 14.3 | 2.41 | 58 | 18 | 3.8 | 5.0 | 18.5 | 17.2 | 15.3 | -0.06 | 4 | -3 | -0.1 | 0.1 | 0.4 | 0.1 | 1.0 |
| 4.5 | TBA | 108-01 | 2.27 | 61 | 22 | 2.7 | 4.2 | 25.7 | 23.7 | 19.8 | 2.51 | 73 | 32 | 3.1 | 4.5 | 21.0 | 19.3 | 17.3 | 0.24 | 12 | 11 | 0.4 | 0.3 | -4.7 | -4.4 | -2.5 |
| 4.5 | 2011 | 108-21 | 2.63 | 75 | 42 | 3.8 | 5.0 | 19.7 | 17.6 | 14.2 | 2.68 | 75 | 44 | 4.1 | 5.1 | 17.2 | 15.7 | 13.8 | 0.06 | 0 | 2 | 0.3 | 0.0 | -2.5 | -1.9 | -0.4 |
| 4.5 | 2010 | 108-31 | 2.50 | 63 | 29 | 3.3 | 4.8 | 19.7 | 18.0 | 14.8 | 2.44 | 62 | 29 | 3.6 | 4.9 | 19.5 | 17.5 | 15.5 | -0.06 | -1 | 1 | 0.3 | 0.1 | -0.2 | -0.5 | 0.7 |
| 4.5 | 2009 | 108-19 | 2.45 | 63 | 28 | 3.0 | 4.5 | 21.0 | 19.3 | 16.0 | 2.39 | 62 | 29 | 3.2 | 4.5 | 20.9 | 18.9 | 16.8 | -0.06 | -1 | 0 | 0.2 | 0.0 | -0.1 | -0.4 | 0.8 |
| 5.0 | TBA | 110-17 | 2.50 | 66 | 48 | 3.8 | 4.5 | 20.5 | 18.8 | 16.0 | 2.21 | 51 | 28 | 3.3 | 4.1 | 21.2 | 20.5 | 18.7 | -0.29 | -16 | -19 | -0.5 | -0.3 | 0.7 | 1.7 | 2.7 |
| 5.0 | 2010 | 111-21 | 2.57 | 71 | 42 | 3.6 | 5.1 | 18.5 | 16.6 | 13.5 | 2.57 | 66 | 42 | 4.0 | 5.1 | 16.6 | 15.4 | 13.6 | 0.00 | -5 | 0 | 0.3 | 0.0 | -1.9 | -1.2 | 0.1 |
| 5.0 | 2009 | 111-08 | 2.34 | 60 | 28 | 2.9 | 4.6 | 21.3 | 19.3 | 16.0 | 2.33 | 53 | 26 | 3.2 | 4.5 | 19.0 | 18.0 | 16.3 | -0.01 | -7 | -2 | 0.3 | -0.1 | -2.3 | -1.3 | 0.3 |
| 5.0 | 2005 | 111-30 | 2.37 | 53 | 35 | 3.8 | 4.7 | 16.3 | 15.1 | 13.1 | 2.35 | 49 | 34 | 3.9 | 4.6 | 15.7 | 14.8 | 13.3 | -0.02 | -4 | -2 | 0.2 | 0.0 | -0.6 | -0.3 | 0.2 |
| 5.0 | 2004 | 112-09 | 2.45 | 54 | 43 | 4.3 | 4.8 | 13.2 | 12.5 | 11.1 | 2.40 | 49 | 40 | 4.4 | 4.8 | 13.2 | 12.5 | 11.6 | -0.04 | -5 | -4 | 0.1 | -0.1 | 0.0 | 0.0 | 0.5 |
| 5.0 | 2003 | 112-19 | 2.39 | 48 | 39 | 4.3 | 4.8 | 12.3 | 11.5 | 10.5 | 2.35 | 44 | 35 | 4.4 | 4.8 | 12.3 | 11.7 | 10.9 | -0.04 | -4 | -3 | 0.1 | -0.1 | 0.0 | 0.2 | 0.4 |
| 5.5 | TBA | 111-30+ | 2.07 | 49 | 26 | 2.5 | 3.9 | 25.5 | 23.4 | 20.6 | 2.21 | 56 | 36 | 3.0 | 4.0 | 22.4 | 21.4 | 19.6 | 0.14 | 7 | 10 | 0.4 | 0.1 | -3.1 | -2.0 | -1.0 |
| 5.5 | 2008 | 111-30+ | 2.34 | 67 | 45 | 3.0 | 4.1 | 22.9 | 21.0 | 18.4 | 2.44 | 71 | 52 | 3.4 | 4.2 | 20.2 | 19.3 | 17.7 | 0.10 | 4 | 7 | 0.4 | 0.0 | -2.7 | -1.7 | -0.7 |
| 5.5 | 2005 | 112-26+ | 2.64 | 79 | 66 | 3.9 | 4.6 | 16.3 | 15.1 | 13.3 | 2.67 | 81 | 68 | 4.1 | 4.6 | 15.3 | 14.4 | 13.0 | 0.04 | 1 | 3 | 0.2 | 0.0 | -1.0 | -0.7 | -0.3 |
| 5.5 | 2004 | 113-22+ | 2.63 | 73 | 64 | 4.4 | 4.8 | 13.4 | 12.6 | 11.4 | 2.64 | 72 | 65 | 4.5 | 4.8 | 12.9 | 12.3 | 11.3 | 0.01 | 0 | 1 | 0.2 | 0.0 | -0.5 | -0.3 | -0.1 |
| 5.5 | 2003 | 113-28+ | 2.56 | 67 | 59 | 4.3 | 4.7 | 12.6 | 12.0 | 11.0 | 2.55 | 65 | 58 | 4.4 | 4.7 | 12.4 | 11.9 | 11.0 | -0.01 | -2 | -1 | 0.1 | 0.0 | -0.2 | -0.1 | 0.0 |
| 6.0 | TBA | 112-23 | 2.28 | 67 | 52 | 2.8 | 3.8 | 25.0 | 23.4 | 20.9 | 2.39 | 73 | 59 | 3.1 | 3.8 | 22.3 | 21.7 | 20.2 | 0.11 | 6 | 8 | 0.3 | 0.0 | -2.7 | -1.7 | -0.7 |
| 6.0 | 2008 | 112-23 | 2.65 | 93 | 78 | 3.3 | 4.1 | 22.1 | 20.5 | 18.2 | 2.77 | 100 | 87 | 3.6 | 4.1 | 19.3 | 18.8 | 17.4 | 0.12 | 7 | 9 | 0.3 | 0.0 | -2.8 | -1.7 | -0.8 |
| 6.0 | 2007 | 112-23 | 2.59 | 89 | 74 | 3.1 | 4.0 | 22.4 | 20.9 | 18.4 | 2.79 | 103 | 89 | 3.6 | 4.2 | 19.0 | 18.5 | 16.9 | 0.20 | 13 | 15 | 0.5 | 0.1 | -3.4 | -2.4 | -1.5 |
| 6.0 | 2006 | 112-31 | 2.68 | 95 | 80 | 3.3 | 4.2 | 20.8 | 19.3 | 16.9 | 2.86 | 106 | 93 | 3.8 | 4.3 | 17.9 | 17.1 | 15.6 | 0.18 | 11 | 14 | 0.5 | 0.1 | -2.9 | -2.2 | -1.3 |
| 6.0 | 2004 | 114-03 | 2.96 | 106 | 100 | 4.3 | 4.6 | 13.7 | 13.0 | 11.8 | 2.99 | 107 | 101 | 4.5 | 4.7 | 13.3 | 12.6 | 11.6 | 0.02 | 1 | 2 | 0.1 | 0.0 | -0.4 | -0.4 | -0.2 |
| 6.0 | 2003 | 114-19 | 2.87 | 97 | 92 | 4.3 | 4.6 | 12.8 | 12.3 | 11.2 | 2.87 | 97 | 92 | 4.4 | 4.6 | 12.6 | 12.1 | 11.2 | 0.00 | -1 | 0 | 0.1 | 0.0 | -0.2 | -0.2 | 0.0 |
| 6.5 | TBA | 114-14+ | 2.68 | 90 | 81 | 3.4 | 4.0 | 22.8 | 20.8 | 18.4 | 2.72 | 94 | 86 | 3.6 | 4.0 | 20.1 | 19.6 | 18.3 | 0.04 | 3 | 4 | 0.2 | 0.0 | -2.7 | -1.2 | -0.1 |
| 6.5 | 2008 | 114-14+ | 3.00 | 115 | 106 | 3.8 | 4.3 | 20.2 | 18.3 | 16.2 | 3.05 | 119 | 112 | 4.0 | 4.3 | 17.7 | 17.3 | 16.0 | 0.05 | 4 | 6 | 0.2 | 0.0 | -2.5 | -1.0 | -0.2 |

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