

# Agency Fixed Rate Prepayment Model V1.39

## Mortgage Index Models

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## 1.0 Overview

After the close of business on Friday, January 13, 2017, 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 (V1.39) in the Preferences tab of the mortgage calculator. This model version will also be made available within Point at a later date. At the present time this model version will not be available in the Bloomberg terminal. We expect that it will be available during 2017 H1. Future updates will address the availability of this model release on these systems.

### Summary of Model Changes and Impact on Valuations

- **Updated conventional and GNMA models**

The primary changes in model version V1.39 include a stronger burnout function, reduced prepayments for Quicken serviced pools, lower prepayments on high loan size pools, updated GEO effects for New York and Puerto Rico pools, and modestly lower turnover. In addition, for GNMA collateral, updates include lower prepayments on lower WALA FHA loans, lower delinquency roll rates, and changes how multi-issuer pools with large concentrations of loss mitigation loans are run. Finally, we have also made some minor adjustments to our primary secondary spread model.

- **Updated media effect**

Model V1.39 incorporates a new media effect. This captures the additional borrower refinancing response that occurs when mortgage rates reach new lows. Relative to the previous version, the new media effect gives a smaller boost to projections in response to lower rates. This more closely captures the diminished media effect we have observed in recent years.

- **Reduced FHA premium structure**

Model V1.39 incorporates the recently announced reduction in FHA mortgage insurance premiums for loans closed on or after January 27, 2017. Most loan types will see a 25bp reduction in the annual premium charged for FHA mortgage insurance with premiums declining from 85bp to 60bp. Incorporating the MIP change increases 1Y CPR projections on post HARP GNMA collateral by 1-4 CPR.

- **Modest effect on valuations**

The effect of changes on model valuations are generally modest. Libor OASs for lower coupon conventional pass-throughs (3s-4s) are slightly wider relative to V1.37. Libor OADs are slightly longer for lower coupons in V1.39, increasing by approximately 0.1-0.3 years. The impact of model changes on seasoned, higher coupons is more noticeable. Libor OASs on pre HARP cohorts are 10-30bp higher, while durations extend by 0.5-1.5 years. In the GNMA sector, OASs for post HARP cohorts are 0-10bp tighter and OADs are 0.0-0.4 years shorter as a result of the MIP cut.

## 2.0 Updates to the conventional and GNMA models

As part of the release of model version V1.39, we are adjusting projections in response to prepayment data received since the previous update, V1.37. In addition, we are making selected improvements to the structure of the model where needed. While the latest release contains many small adjustments, we summarize the main changes below.

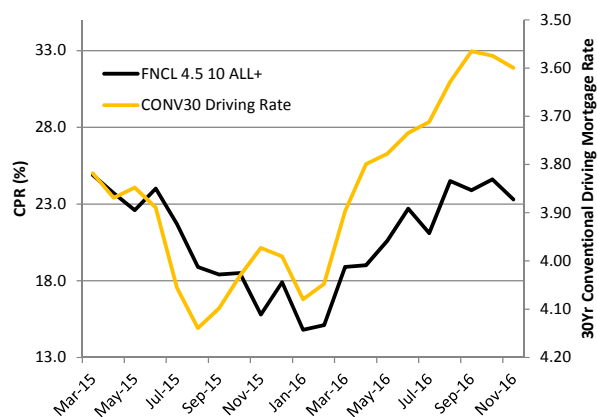
### Strengthened burnout effect

In 2016, seasoned cohorts exhibited a more subdued refinancing response than anticipated. Despite mortgage rates approaching historic lows, seasoned cohorts failed in many cases to exceed prepayment rates from 2015 when rates were much higher. For example, prepayments for FNCL 4.5s of 2010 in late 2016 failed to surpass levels observed in early 2015 despite driving rates that were 30-35bp lower. Similar behavior can be observed across many seasoned cohorts.

In order to better capture this tepid refinancing response we have strengthened the burnout function. The burnout effect is a multiplier applied to the base refi model and is driven by a measure of the time weighted cumulative economic incentive to refinance (we simply refer to this as cumulative burnout). The key change in V1.39 is that the burnout effect has been reduced for borrowers that have experienced moderate to high levels of cumulative burnout. **Figure 2** shows the new vs. old burnout effect.

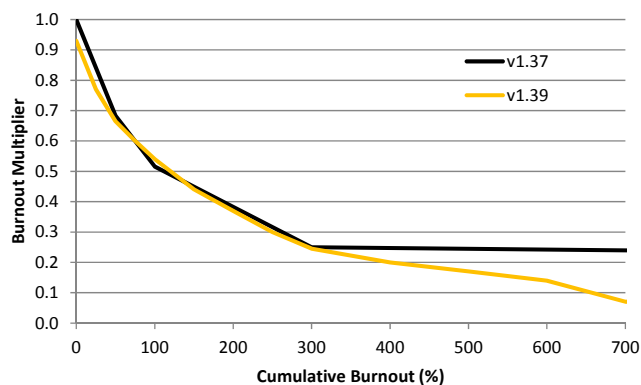
**Figure 3** shows the historic fits for selected seasoned cohorts in V1.39 versus V1.37. The changes in the burnout effect generally result in much better fits during the mortgage rate rally in 2016. Errors for model version V1.37 were 2-5 CPR during 2016 H2, but have been largely erased in the latest model version.

FIGURE 1  
Seasoned cohorts showed a tepid refi response



Source: Bloomberg L.P., Barclays

FIGURE 2  
New versus old burnout effect



Source: Bloomberg L.P., Barclays

FIGURE 3

**Model V1.39 fits versus V1.37 on seasoned cohorts**

Coupon	Vintage	6-Mo CPR				
		Actual	v1.39 Proj	v1.39 Error	v1.37 Proj	v1.37 Error
4.0	2011	22.5	23.2	0.7	22.8	0.3
	2010	23.3	23.7	0.4	24.0	0.7
4.5	2011	21.8	23.6	1.8	25.1	3.3
	2010	23.4	23.9	0.5	26.1	2.7
5.0	2010	23.3	22.8	-0.5	26.3	3.0
	2005	22.0	22.2	0.3	25.3	3.3
	2003	19.1	19.2	0.0	19.7	0.6
5.5	2008	23.5	22.8	-0.6	27.7	4.2

Nov-2016 prepays. Source: Bloomberg L.P., Barclays

FIGURE 4

**Prepayments on Quicken serviced pools have declined**

Coupon	Vintage	Sep-2016, 3-Mo CPR	
		Quicken	All
3.0	15	19.2	17.3
3.5	15	19.3	20.5
	14	33.4	27.9
4.0	15	20.3	19.7
	14	27.3	27.4
4.5	14	21.2	23.0
Coupon	Vintage	Feb-2015, 3-Mo CPR	
		Quicken	All
3.0	13	7.9	5.1
3.5	14	41.5	13.5
	13	31.5	11.2
4.0	14	42.4	17.7
4.5	14	28.6	14.2

Source: Bloomberg L.P., Barclays

## Lower prepayments on Quicken serviced loans

Servicer behavior has been a key driver of prepayments and valuations across securities. Given the noticeable difference in observed prepayment profiles across servicers, we introduced an expanded set of servicer effects and user knobs in model V1.37, covering the top 30 servicers. One of the most substantial servicer effects added in V1.37 was for Quicken serviced loans. This was done to adjust for the significantly stronger refinancing response of Quicken serviced pools relative to the generic cohort. In early 2015, for example, many Quicken serviced pools prepaid 20-30 CPR faster than the generic cohort (**Figure 4**)

Since the release of V1.37, however, we have seen a significant change in the behavior of Quicken serviced pools. Once 2-3 times faster than the cohort, prepayments on Quicken serviced pools are now only moderately faster than the cohort. It's likely that concerns around secondary market execution may have led Quicken to adjust their solicitation efforts. As a result, we are weakening the Quicken servicer effect in the refinance model to better reflect recent behavior. **Figure 5** shows historic projections for Quicken serviced pools under V1.39 and V1.37.

## Reduced prepayments on high loan size pools

In addition to increasing the burnout effect in the model, we have also made some modest adjustments to the effect of loan size on refinancing. The changes incorporate a reduced response of higher loan size pools in 2016 relative to previous refinancing episodes. **Figure 6** shows model projections for V1.39 and V1.37 for selected worst-to-deliver (i.e. non-specified pool type) cohorts.

FIGURE 5

Model V1.39 fits versus V1.37 on Quicken serviced pools

Coupon	Vintage	6-Mo CPR				
		Actual	v1.39 Proj	v1.39 Error	v1.37 Proj	v1.37 Error
3.0	15	17.3	17.6	0.3	43.2	25.9
	13	16.5	16.5	0.0	27.1	10.6
	12	17.2	16.0	-1.2	26.5	9.3
3.5	15	20.0	21.1	1.1	44.7	24.7
	14	33.5	30.8	-2.6	58.4	24.9
	13	26.0	25.9	-0.1	44.2	18.2
4.0	12	23.9	24.3	0.5	40.2	16.3
	15	20.5	19.6	-0.9	35.3	14.8
	14	27.6	27.5	-0.1	48.2	20.6
4.5	12	25.2	24.1	-1.1	34.6	9.4
	14	20.1	22.7	2.5	35.2	15.1

Nov-2016 prepaids. Source: Bloomberg L.P., Barclays

FIGURE 6

Model V1.39 fits versus V1.37 on W2D cohorts

Coupon	Vintage	6-Mo CPR				
		Actual	v1.39 Proj	v1.39 Error	v1.37 Proj	v1.37 Error
3.5	15	21.6	22.6	1.0	25.2	3.6
	14	29.3	31.0	1.7	35.0	5.7
	13	22.1	22.4	0.3	24.4	2.3
4.0	12	20.8	21.8	1.0	22.9	2.1
	11	21.8	22.5	0.7	23.0	1.2
	14	30.9	31.4	0.5	34.8	3.9
4.5	13	30.6	31.3	0.7	32.1	1.5
	11	24.4	25.7	1.3	25.3	0.9
	10	24.4	25.4	1.0	25.9	1.5
4.5	11	23.8	25.8	2.0	28.2	4.4
	10	24.8	25.8	1.0	28.6	3.8

Nov-2016 prepaids. Source: Bloomberg L.P., Barclays

## Decreased refinancing response for low WALA FHA loans

On the GNMA side, one significant change between model versions V1.37 and V1.39 is their treatment of low WALA FHA loans (0-24 WALA in particular). Amid near historic lows in mortgage rates during 2016, the strong FHA refinance ramp introduced in V1.37 produced model OADs for low WALA GNMA cohorts that were significantly shorter than empirical durations, and even negative in some instances.

In model version V1.39 we have scaled back the FHA refi ramp, reducing the callability of new production GNMA collateral. As can be seen in **Figure 7**, this change significantly reduces model errors for low WALA GNMA II cohorts during 2016 H2. In addition, V1.39 OADs from this time period track empirical durations much more closely. **Figure 8** shows model and empirical durations for GNMA II 3.5s during 2016. As rates fell OADs for V1.37 fell far below empirical durations, even turning negative at times. In contrast, OADs for V1.39 match empirical durations much more closely.

## Adjustments to the way GN pools with high loss mitigation concentration are treated

One challenge with pool level models is that they tend to struggle when the underlying loans are very heterogeneous. This is the case with GNMA II multi-issuer pools as they contain loans with very different MIP structure, loan type (FHA, VA, RHS, etc.), loan size, and credit performance. It has become particularly difficult to project prepayments on pools with a high concentration of loss mitigation loans (modified loans).

**Figure 9** shows a few GNMA II multi-issuer pools with high concentrations of loss mitigation loans, and further breaks down the characteristics for both the loss mitigation and non-loss mitigation loans. A couple of key observations:

- FHA MIPs tend to be lower on loss mitigation loans
- Loan sizes tend to be lower on loss mitigation loans

FIGURE 7

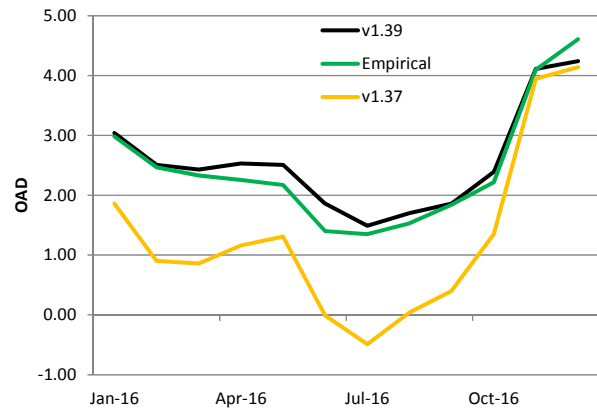
Model V1.39 fits versus V1.37 on new prod G2 cohorts

Coupon	Vintage	6-Mo CPR				
		Actual	v1.39 Proj	v1.39 Error	v1.37 Proj	v1.37 Error
3.0	15	19.2	18.4	-0.8	15.4	-3.8
	14	23.1	22.4	-0.7	23.2	0.1
3.5	15	26.6	26.4	-0.2	30.5	3.9
	14	27.2	27.9	0.7	31.0	3.8
4.0	15	30.7	28.2	-2.5	40.8	10.1
	14	27.0	27.4	0.4	28.3	1.3

Nov-2016 prepaes. Source: Bloomberg L.P., Barclays

FIGURE 8

V1.39 OADs match empiricals much better, GNMA II 3.5s



Source: Bloomberg L.P., Barclays

- FICO scores tend to be much lower for loss mitigation loans

The breakdown shows that collateral characteristics are very different across groups, and in areas that are key drivers of GNMA prepayments. This is where the problem lies. Rather than running the individual loans with their characteristics as a loan level model would, a pool level model runs the aggregated characteristics of the entire pool. The problem is that loss mitigation loans behave very differently than non-loss mitigation loans, independent of their other collateral characteristics. In particular, they tend to have very low voluntary prepayments. This lends itself nicely to the use of a dampening multiplier on the refinance and turnover functions, where the strength of the multiplier applied is proportional to the percentage of loss mitigation loans in the pool. The complicating factor, however, is that the loss mitigation loans also alter the overall characteristics of the pool, making it look less callable than implied by the non-loss mitigation portion. As a result, utilizing the average characteristics of the pool will tend to underestimate prepayments on the clean portion of the pool and hence the overall pool as well.

In an attempt to compensate for this issue, model version V1.39 adjusts the running MIP, loan size, and FICO used to better reflect the characteristics of the clean loans within the pool. This adjustment allows the model to project prepayments on the non-loss mitigation portion of the pool better, with the loss mitigation multiplier dampening the projection in proportion to the concentration of loss mitigation loans within the pool. **Figure 10** shows projected prepayments from model versions V1.37 and V1.39 on selected pools with high loss mitigation concentrations. Model V1.39 is much more effective in projecting the prepayments on these types of GNMA II pools.

FIGURE 9

## Breakdown of sample G2 pools by loss mitigation

Coupon	Pool Number	Loss Mitigation (%)		Total	Loss Mitigation	Performing
3.5	MA1448	21	MIP	102	55	120
			Lnsz(\$K)	162	145	168
			FICO	694	614	713
4.0	MA2679	42	MIP	82	59	102
			Lnsz(\$K)	148	131	164
			FICO	650	614	666
4.5	MA1997	21	MIP	91	56	102
			Lnsz(\$K)	132	123	135
			FICO	662	611	699

Source: Bloomberg L.P.

FIGURE 10

## Model V1.39 handles G2 pools with loss mitigation better

Coupon	Pool Number	6-Mo CPR				
		Actual	v1.39 Proj	v1.39 Error	v1.37 Proj	v1.37 Error
3.5	MA1448	23.2	24.1	0.9	18.5	-4.7
4.0	MA2679	25.9	26.5	0.6	22.2	-3.7
4.5	MA1997	27.1	27.9	0.8	25.7	-1.4

Nov-2016 prepaids. Source: Bloomberg L.P., Barclays

## Lower roll rates on GNMA loans

As part of our general update we reviewed delinquency roll rates and buyout rates in the GNMA sector. One observation we have noted over the past year is that GNMA roll rates have declined across the board. As the economy continues to improve we are seeing credit performance in GNMA loans improve as well. In order to capture this improvement we have reduced GNMA roll rates in V1.39. **Figure 11** shows actual and projected delinquency roll rates and buyouts for various cohorts under model versions V1.37 and V1.39.

## Updated GEO effects for NY and PR pools

During the recent rate rally, prepayments on pools backed by properties located in New York (NY) did not pick up nearly as much as in other areas, and even less than predicted by model V1.37. Transaction costs (including a NY mortgage recording tax) have proved to be an even bigger hurdle to refinancing than is currently accounted for in the model. As a result, in model V1.39 we have further weakened the refinancing response for NY loans. **Figure 12** shows actual and model prepayment projections for NY pools.

We have also revised the geographic effects for pools backed by properties located in Puerto Rico (PR). The territory is currently in the midst of a decade long economic contraction and home prices remain nearly one third below pre crisis levels. As a consequence of continued economic weakness, turnover on PR pools has been well below expectations. To account for this in V1.39, we have reduced turnover for PR pools.

## Modestly reduced turnover

In model version V1.37, we increased turnover by 10% as a recovering economy and housing market boosted existing home sales. In model version V1.39, we take a portion of this increase back as we expect housing activity to moderate as the Fed enters a tightening cycle that could lead to noticeably higher real (in addition to nominal) interest rates. The adjustment lowers long term prepayments on lower coupons by 0.4-0.5 CPR.

FIGURE 11

**GNMA roll rates have been reduced in model V1.39**

Program	Coupon	Vintage	12-Mo	Actual	v1.39		v1.37	
					Proj	Error	Proj	Error
GNMA II	4.0	11	Roll Rate	2.3	2.3	0.0	2.8	0.5
			CBR	2.7	2.7	0.0	3.0	0.3
GNMA II	4.5	10	Roll Rate	2.3	2.8	0.5	3.5	1.2
			CBR	2.6	2.7	0.1	3.0	0.4
GNMA I	5.5	05	Roll Rate	3.5	3.2	-0.1	4.3	0.8
			CBR	3.9	4.0	0.1	4.1	0.2
GNMA I	6.0	07	Roll Rate	4.8	4.9	0.7	6.2	1.4
			CBR	5.3	5.3	-0.1	5.3	0.0

Nov-2016 prepaes. Source: Bloomberg L.P., Barclays

FIGURE 12

**Revised GEO effects for NY pools**

Coupon	Vintage	6-Mo CPR				
		Actual	v1.39 Proj	v1.39 Error	v1.37 Proj	v1.37 Error
3.5	15	4.8	6.0	1.2	7.5	2.7
	13	9.4	8.1	-1.3	9.8	0.4
4.0	12	10.1	8.3	-1.8	9.8	-0.3
	14	14.7	15.1	0.5	19.1	4.4
4.5	09	18.3	18.6	0.3	24.2	5.9

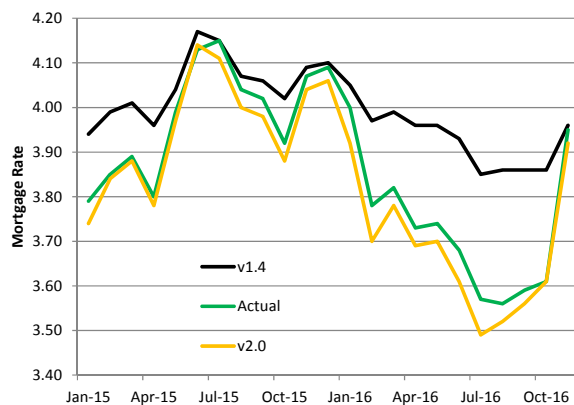
Nov-2016 prepaes. Source: Bloomberg L.P., Barclays

## Updated Primary-Secondary spread model

As part of the V1.37 model update in late 2015 we also released a new primary-secondary spread model, PSS V2.0. Relative to the previous model, mortgage rates projected by PSS V2.0 were substantially more accurate. **Figure 13** shows projected mortgage rates aligned closely with actual mortgage rates. With that said, we did note that mortgage rate projections under PSS V2.0 were slightly lower than observed survey rates during 2016. We address this in PSS V2.1 by increasing the responsiveness of the primary-secondary spread to changes in secondary market rates. As can be seen in **Figure 14**, this more closely aligns projected mortgage rates with actual survey rates.

FIGURE 13

**PS spread model V2.0 has performed well in 2016**



Source: Bloomberg L.P., Barclays

FIGURE 14

**PS spread model been updated for model V1.39**

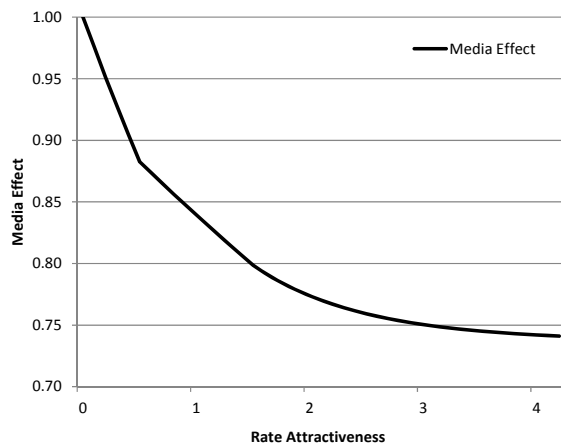
Conventional 30yr Mortgage Rates					
Term	Actual	v2.1 proj	v2.1 error	v2.0 proj	v2.0 error
1M	3.95	3.95	0.00	3.92	-0.03
3M	3.72	3.74	0.02	3.70	-0.02
6M	3.66	3.67	0.01	3.62	-0.04
12M	3.76	3.76	0.00	3.71	-0.05
24M	3.87	3.87	0.00	3.83	-0.04
GNMA 30yr Mortgage Rates					
Term	Actual	v2.1 proj	v2.1 error	v2.0 proj	v2.0 error
1M	3.79	3.73	-0.06	3.70	-0.09
3M	3.56	3.55	-0.01	3.51	-0.05
6M	3.51	3.49	-0.02	3.45	-0.06
12M	3.59	3.59	0.00	3.55	-0.04
24M	3.69	3.71	0.02	3.67	-0.02

Nov-2016 mortgage rates. Source: Bloomberg L.P., Barclays



FIGURE 15

Media effect as a function of rate attractiveness



Source: Bloomberg L.P.

## Updated media effect

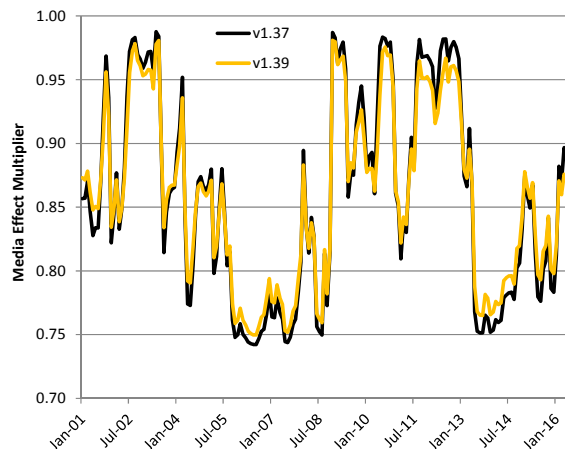
The media effect captures how the borrower refinancing response changes when rates approach a new low. We capture this effect with a rate attractiveness variable that compares current and past mortgage rates. The value of this variable is dependent on: 1) the current level of mortgage rates; 2) the time that has passed since mortgage rates were last below current levels; and 3) the amount of time mortgage rates were below current levels. When mortgage rates fall below historic lows, the rate attractiveness variable converges to zero and the refinancing function is at maximum efficiency. As we move away from historic lows the value of the rate attractiveness variable increases flattening the refinancing curve. **Figure 15** shows the media effect multiplier as a function of rate attractiveness.

In model V1.37, the rate attractiveness variable for the media effect measures the ratio of current to previous mortgage rates. One shortcoming of this approach is that as rates get lower, smaller movements in rates are needed to get the same increase in the media effect. Given the tepid response of borrowers to recent lows in rates, this is not a desired effect. In order to remove this behavior, model V1.39 uses a rate attractiveness measure that compares relative payments at current and past mortgage rates. The benefit of this approach is that the ratio of payment changes is a more stable measure across rate levels. Thus the media effect associated with a new low in mortgage rates would be relatively similar at a 5% mortgage rate and a 3% mortgage rate for V1.39, whereas this would not be the behavior of the media effect in V1.37.

**Figure 16** shows the media effect refinancing multiplier for model versions V1.37 and V1.39. At higher rate levels there is relatively little difference between the two. However, as rates hit new lows following the financial crisis one sees that the media effect in V1.39 produces a smaller multiplier. We find that this behavior is much more desirable in the current environment.

FIGURE 16

Media effect for model V1.37 versus V1.39



Source: Bloomberg L.P.

## 3.0 FHA announces changes to mortgage insurance premiums

The Federal Housing Administration announced on January 9, 2017 that it will reduce the annual mortgage insurance premium (MIP) on certain mortgages with a closing / disbursement date on or after January 27, 2017<sup>1</sup>. Most loans will see a 25bp reduction in the annual premium charged for FHA mortgage insurance with premiums declining from 85bp to 60bp.

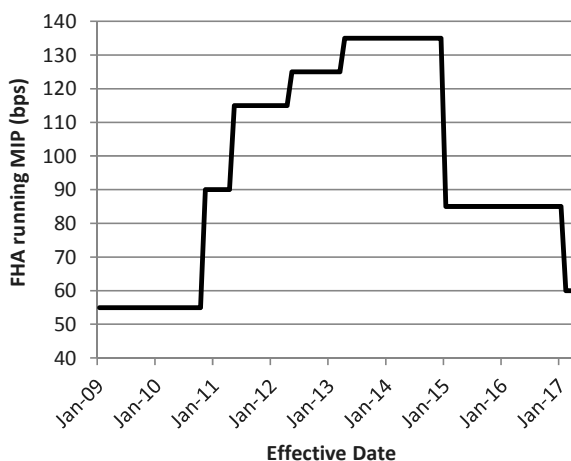
Given the ongoing recovery in the US housing market and improving outlook for the FHA mortgage insurance fund, the recently announced change continues a policy shift toward normalizing fees and promoting credit availability. The latest reduction in running mortgage insurance premiums returns them to pre housing crisis levels (Figure 17).

**Figure 18** displays current FHA insurance premiums along with the new MIP structure that is incorporated in model V1.39. There are several points to note:

- For 30y collateral, the annual MIP on new >95 and <=95 LTV mortgages will be 60bp and 55bp, respectively, down from 85bp and 80bp.
- The policy change has no effect on FHA mortgages originated prior to June 2009. These mortgages have already been eligible for a streamline refinance with a mortgage insurance premium of 55bp.
- For 15y collateral, the annual MIP on new >90 and <=90 LTV mortgages will be 50bp and 25bp, respectively, down from 70bp and 45bp.

FIGURE 17

30y FHA annual mortgage insurance premiums over time



Source: Bloomberg L.P.

FIGURE 18

Current and new FHA MIP structure

Loan Type	Origination Date	LTV	Upfront MIP (bps)	Running MIP	New Running MIP
30Y	before June 2009	> 95	1	55	55
		<= 95	1	55	55
	after May 2009	> 95	175	85	60
		<= 95	175	80	55
30Y High Cost	after May 2009	> 95	175	105	60
		<= 95	175	100	55
15Y	after May 2009	> 90	175	70	50
		<= 90	175	45	25
15Y High Cost	after May 2009	> 90	175	95	50
		78-90	175	70	25
		<= 78	175	45	25

Note: new MIP structure applies to mortgages with case numbers assigned on or after January 27, 2017. Source: HUD, Bloomberg L.P.

<sup>1</sup> <https://portal.hud.gov/hudportal/documents/huddoc?id=17-01ml.pdf>

- Higher cost loans (>625K) will no longer pay a MIP higher than loans with original balance <=625K. The annual MIP on 30y high cost loans with >95 LTV and <=95 LTV will fall to 60bp and 55bp from 105bp and 100bp, respectively. The annual MIP on 15y high cost loans with >90 LTV, 78-90 LTV, and <=78 LTV will fall to 50bp, 25bp, and 25bp, from 95bp, 70bp, and 45bp, respectively.

## Examining the effect of FHA MIP on GNMA prepayments

**Figure 19** shows that incorporating the 25bp MIP reduction for various GNMA II cohorts increases 1Y CPR projections at current rates by 1-4 CPR.

- Projected prepayments increase a bit more in cuspy coupons. Prepayment projections on most GNMA II 3.5 and 4 cohorts increase by 2-4 CPR, while GNMA II 3 cohorts increase by 0.5-2 CPR.
- Projected prepayments increase more on newer cohorts due to their lower burnout.
- Reducing mortgage rates by 50bp increases the effect of the MIP change on most cohorts. For newer production GNMA II 3.5s and 4s, the MIP change causes prepayment projections to increase 4-5 CPR when mortgage rates are 50bp lower than current levels.

**Figure 19: Effect of FHA MIP Changes on GNMA II**

Coupon	Vintage	1Y CPR		1Y CPR Change			Libor OAS		OAS Change
		v1.39, no MIP Change	v1.39	Down 50	Base	Up 50	v1.39, no MIP Change	v1.39	Base
3.0	15	8.7	10.0	2.9	1.3	0.4	15	13	-2
	14	10.9	12.6	2.0	1.7	0.9	15	14	-1
	13	11.7	12.3	0.7	0.6	0.8	22	20	-1
	12	11.7	12.4	0.6	0.7	0.9	23	22	-1
3.5	15	12.6	15.5	5.3	2.9	1.1	11	4	-7
	14	14.7	16.8	2.1	2.1	1.2	15	11	-3
	13	13.7	14.9	1.7	1.2	1.0	20	16	-4
	12	13.9	14.5	1.4	0.6	1.0	23	19	-3
4.0	11	15.0	15.8	2.7	0.8	0.5	23	20	-3
	15	17.2	21.1	4.3	3.9	2.1	24	14	-11
	14	17.6	20.2	2.3	2.6	1.9	27	21	-6
	13	17.1	19.6	2.3	2.5	1.2	30	24	-6
4.5	12	16.4	18.1	2.6	1.7	0.8	10	2	-7
	11	16.2	18.1	2.2	1.9	0.6	36	31	-5
	10	15.7	16.3	2.0	0.6	1.3	36	30	-6
	14	19.3	21.9	2.2	2.6	1.8	57	49	-8
5.0	13	18.3	20.6	1.9	2.3	1.4	61	55	-7
	11	16.8	18.8	1.7	2.0	0.9	69	62	-6
	10	17.5	18.9	3.9	1.4	0.7	63	55	-9
	10	16.9	19.0	2.3	2.1	0.7	99	91	-8

As of 1/10/2017. Source: Bloomberg L.P., Barclays

## 4.0 Valuation Impact

Overall, model risk and valuation metrics experienced only modest changes between V1.37 and V1.39. In the conventional sector we see durations are modestly longer, OAS changes are flat to modestly wider and projected prepayments are generally flat to lower at current rate levels. As a result of the recent MIP cut, we see different behavior in the GNMA sector. Here we see OAS is tighter, durations are shorter, and prepayments are higher in model V1.39. **Figures 21 – 26** summarize the model valuation and risk metric changes between V1.37 and V1.39 for various sectors. Below we briefly summarize some of the key changes.

### Conventional 30Y

- **OASs are generally wider.** For lower coupons (3s-4s), widening is fairly modest at 0-5bp. We observe a much larger effect for higher coupons with OAS changes of 10-40bp. This change is primarily the result of greater burnout for seasoned cohorts.
- **OADs are longer.** For lower coupons (3s-4s), duration extension is fairly mild at 0.1-0.3 years. This is primarily a result of modestly lower projected turnover. Durations extend much more for higher coupons, 0.5-1.5 years.
- **Prepayments are lower.** For lower coupons (3s-4s), lifetime prepayments are about 0-0.5 CPR lower. For higher coupons lifetime prepayments are 1-4 CPR lower.

### GNMA 30Y

- **OASs are tighter.** For post HARP cohorts, tightening is approximately 0-10bp. The largest changes are seen on new cohorts with spreads 5-10bp tighter. This is because the effect of the FHA MIP reduction included in V1.39 is strongest on these cohorts.
- **OADs are shorter.** For lower coupons (3s-4s), OADs are modestly shorter, 0-0.4 years. This is primarily a result of faster projected prepayments stemming from the MIP cut. For seasoned, higher coupon cohorts, however, we see moderately longer duration, as these cohorts experience no MIP change.
- **Prepayments are generally higher.** For 3s-4.5s, lifetime prepayments are about 0-3 CPR higher, with nearly all of this increase being driven by the MIP cut.

### IOS

- **OASs are 50bp wider for lower coupons (3s-4s).** Spreads are modestly wider in V1.39 in response to slightly lower projected turnover. Overall, Libor OASs are in the 0-50bp range for newer production.

# Bloomberg

- **OASs are 100-200bp wider for higher coupons.** Spreads are wider in V1.39 on seasoned, high coupon cohorts due to the more pronounced burnout function. Overall, Libor OASs are in the 50-250bp range (excluding 2003 and 2005 cohorts).

While changes in model risk and valuation metrics look modest, it is worth noting that changes to the refinancing subcomponent are more substantial. The recent sell off in rates has reduced the importance of refinancing as a driving factor of valuations. Given the similar turnover functions across models V1.39 and V1.37 we see only modest changes in risk metrics and valuations.

Prior to the recent back up in rates, the refinancing subcomponent of the model had a stronger effect on valuations. In that type of rate environment, the stronger burnout effect and weaker media effect in V1.39 would result in more significant differences between models. **Figure 20** shows model OASs, OADs, and 1Y CPRs for TBAs under V1.37 and V1.39 for different rate regimes including 1) the low rate environment of month end September 2016 and 2) the higher rate environment at 2016 year end. We'll note a few key observations.

- Durations are significantly longer under model V1.39 when rates are lower. Comparing models as of month end September 2016 produces TBA durations that are 0.6-1.8 years longer in V1.39 than in V1.37. In addition, OASs are significantly wider (10-30bp).
- Prepayment differences are much greater between the two models at lower rates. Comparing the models as of month end September 2016 produces prepayment projections that are 2-5 CPR lower in V1.39 than in V1.37.

**Figure 20: FNMA 30Y TBA OAS / OAD / 1YR Projected CPR for Sept and Dec month end, V1.37 vs V1.39**

9/30/2016		Prod V1.37			Beta V1.39			Change		
Coupon	Price	OAS	OAD	CPR 1Y	OAS	OAD	CPR 1Y	OAS	OAD	CPR 1Y
3.0	103-30	13	3.1	12.6	20	3.7	10.8	7	0.6	-1.8
3.5	105-17	9	1.1	31.2	24	2.1	25.8	15	1.0	-5.4
4.0	107-13	24	1.5	27.8	43	2.6	25.2	19	1.1	-2.6
4.5	109-16+	29	1.6	25.6	54	2.8	23.9	26	1.2	-1.7
5.0	111-03+	-6	1.1	29.6	61	2.9	24.7	66	1.8	-4.9
12/30/2016		Prod V1.37			Beta V1.39			Change		
Coupon	Price	OAS	OAD	CPR 1Y	OAS	OAD	CPR 1Y	OAS	OAD	CPR 1Y
3.0	99-12	27	6.0	3.9	28	6.3	3.9	1	0.3	0.0
3.5	102-16	26	4.6	8.4	28	4.9	8.4	2	0.3	0.0
4.0	105-04	30	3.9	12.9	35	4.4	13.1	5	0.5	0.2
4.5	107-16	35	3.4	15.4	43	4.0	15.8	8	0.6	0.4
5.0	108-26+	28	2.3	21.6	54	3.6	19.2	27	1.3	-2.4

Source: Bloomberg L.P., Barclays

FIGURE 21

FN 30Y, Market Rates: NY 3PM Close of Tue, Jan 10, 2017

			Prod V1.37								Beta V1.39								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	99-19	3.05	78	31	5.9	6.7	4.0	5.6	7.4	3.05	77	32	6.2	6.9	3.9	5.3	6.9	0.00	-1	1	0.3	0.2	-0.1	-0.3	-0.5
	2016	99-19	3.05	78	33	5.9	6.7	4.0	5.6	7.3	3.05	77	34	6.2	6.9	3.9	5.4	6.9	0.00	-1	1	0.3	0.2	-0.1	-0.2	-0.4
	2015	99-19	3.05	80	33	5.6	6.2	6.5	7.1	8.3	3.05	79	34	5.8	6.4	6.4	6.8	7.8	0.00	-1	1	0.2	0.2	-0.1	-0.3	-0.5
	2013	99-26	3.02	78	43	5.8	6.3	7.2	7.3	7.9	3.02	77	43	6.0	6.4	7.0	6.9	7.4	0.00	-1	0	0.2	0.2	-0.2	-0.4	-0.5
	2012	99-26	3.02	79	43	5.7	6.2	7.1	7.2	7.8	3.02	78	43	5.9	6.4	6.9	6.8	7.4	0.00	-1	0	0.2	0.2	-0.2	-0.4	-0.4
3.5	TBA	102-23	3.02	87	29	4.5	5.8	8.6	9.3	10.6	3.03	87	32	4.8	6.0	8.6	9.1	10.1	0.01	0	3	0.3	0.2	0.0	-0.2	-0.5
	2016	102-23	3.07	88	38	5.2	6.3	5.4	7.3	9.0	3.08	88	41	5.5	6.5	5.4	7.1	8.6	0.01	0	2	0.3	0.2	0.0	-0.2	-0.4
	2015	102-23	3.04	87	34	4.8	5.9	8.2	8.9	10.0	3.05	87	35	4.9	6.1	8.2	8.7	9.5	0.01	0	1	0.2	0.2	0.0	-0.2	-0.5
	2014	102-23	3.00	86	31	4.5	5.6	10.0	10.4	11.2	3.00	86	32	4.7	5.7	10.2	10.4	10.9	0.01	0	1	0.1	0.1	0.2	0.0	-0.3
	2013	102-28	3.01	84	43	5.0	5.9	8.8	8.9	9.3	3.03	84	45	5.2	6.0	8.6	8.6	8.9	0.01	0	2	0.2	0.2	-0.2	-0.3	-0.4
	2012	103-04	2.96	80	40	4.9	5.8	8.8	8.9	9.3	2.98	80	41	5.0	5.9	8.7	8.5	8.8	0.01	0	1	0.1	0.1	-0.1	-0.4	-0.5
	2011	103-06	2.93	79	34	4.6	5.6	9.2	9.3	9.9	2.94	79	34	4.6	5.7	9.1	8.9	9.5	0.01	0	0	0.1	0.1	-0.1	-0.4	-0.4
	2010	103-08	2.87	77	30	4.3	5.3	10.0	10.1	10.8	2.89	77	32	4.4	5.4	9.9	9.6	10.3	0.02	0	1	0.1	0.1	-0.1	-0.5	-0.5
4.0	TBA	105-11	2.90	89	33	3.8	5.3	13.3	13.6	13.6	2.91	89	38	4.3	5.5	13.5	13.7	13.4	0.01	1	5	0.5	0.2	0.2	0.1	-0.2
	2016	105-12	3.06	95	47	4.6	5.8	7.6	9.6	10.8	3.07	96	49	4.9	5.9	7.7	9.5	10.6	0.01	1	3	0.3	0.1	0.1	-0.1	-0.2
	2015	105-11	3.02	93	44	4.3	5.5	10.1	10.8	11.4	3.03	93	46	4.6	5.7	10.3	10.9	11.3	0.00	0	3	0.3	0.1	0.2	0.1	-0.1
	2014	105-11	2.98	91	39	3.9	5.4	11.9	11.9	11.9	2.98	92	42	4.2	5.5	12.2	12.1	11.9	0.00	1	3	0.3	0.1	0.3	0.2	0.0
	2013	105-13	2.99	90	42	4.0	5.4	11.3	11.4	11.3	3.00	91	44	4.3	5.5	11.6	11.5	11.2	0.00	1	3	0.3	0.1	0.3	0.1	-0.1
	2012	105-25	2.96	83	50	4.7	5.5	10.4	10.3	10.3	2.97	84	52	4.8	5.6	10.4	10.2	10.1	0.01	1	2	0.2	0.1	0.0	-0.1	-0.2
	2011	105-27	2.93	83	37	3.9	5.4	10.6	10.4	10.5	2.93	84	38	4.1	5.4	10.8	10.5	10.6	0.00	1	1	0.2	0.1	0.2	0.1	0.1
	2010	105-29	2.87	80	32	3.7	5.2	10.9	10.8	11.0	2.88	81	35	3.9	5.3	11.1	10.8	11.0	0.00	1	3	0.3	0.1	0.2	0.0	0.0
	2009	105-11	2.79	84	27	2.9	4.6	13.4	13.4	13.8	2.78	85	28	3.0	4.6	13.8	13.6	14.0	-0.01	0	1	0.1	0.0	0.4	0.2	0.2
4.5	TBA	107-24	2.77	87	36	3.2	5.0	15.7	15.5	15.2	2.82	88	45	3.9	5.2	16.0	15.3	14.6	0.05	1	9	0.6	0.2	0.3	-0.2	-0.6
	2016	107-24	3.03	99	56	4.2	5.4	9.2	11.2	12.5	3.01	98	57	4.4	5.5	9.9	11.9	12.7	-0.02	-1	1	0.2	0.0	0.7	0.7	0.2
	2015	107-24	3.09	100	64	4.4	5.5	9.9	10.6	11.5	3.07	98	66	4.6	5.5	10.8	11.3	11.8	-0.03	-2	2	0.2	0.0	0.9	0.7	0.3
	2014	107-24	2.98	95	52	3.7	5.2	12.5	12.5	12.6	2.98	95	58	4.1	5.3	13.0	12.8	12.6	0.00	-1	6	0.5	0.1	0.5	0.3	0.0
	2013	107-24	2.96	94	52	3.7	5.1	12.8	12.8	12.7	2.97	94	58	4.2	5.3	13.1	12.9	12.6	0.01	0	6	0.5	0.1	0.3	0.1	-0.1
	2012	108-08	2.91	82	53	4.3	5.2	12.0	11.9	11.7	2.91	82	57	4.5	5.3	12.2	11.9	11.7	0.00	0	3	0.3	0.0	0.2	0.0	0.0
	2011	108-08	2.85	86	37	3.1	5.0	13.0	12.5	12.2	2.89	87	46	3.7	5.2	12.7	12.0	11.7	0.04	2	9	0.7	0.2	-0.3	-0.5	-0.5
	2010	108-08	2.76	82	29	2.7	4.8	13.9	13.3	13.1	2.82	84	40	3.5	5.1	13.3	12.6	12.4	0.06	2	11	0.8	0.2	-0.6	-0.7	-0.7
	2009	108-00	2.73	82	27	2.4	4.6	14.4	14.0	13.8	2.79	84	38	3.2	4.8	13.7	13.3	13.0	0.06	2	11	0.7	0.2	-0.7	-0.7	-0.8
5.0	TBA	109-03	2.29	58	25	2.2	3.9	21.8	21.5	20.7	2.57	72	54	3.5	4.3	19.4	18.8	17.8	0.29	15	29	1.3	0.4	-2.4	-2.7	-2.9

# Bloomberg

			Prod V1.37									Beta V1.39									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			
	2011	109-09	2.88	101	58	2.9	4.7	16.1	15.4	14.9	2.97	104	72	3.8	4.9	15.3	14.5	14.0	0.09	3	14	0.9	0.2	-0.8	-0.9	-0.9			
	2010	109-09	2.78	96	51	2.6	4.5	17.0	16.2	15.8	2.91	102	69	3.7	4.8	15.8	14.9	14.4	0.13	5	19	1.1	0.3	-1.2	-1.3	-1.4			
	2009	109-03	2.78	97	53	2.6	4.4	17.1	16.5	16.0	2.92	103	74	3.8	4.8	15.6	14.9	14.5	0.15	6	21	1.2	0.3	-1.5	-1.6	-1.5			
	2008	109-03	2.42	68	35	2.4	4.0	20.5	20.1	19.4	2.65	79	60	3.6	4.4	18.5	17.9	17.0	0.23	11	25	1.2	0.3	-2.0	-2.2	-2.4			
	2005	109-13	2.50	67	42	2.9	4.1	18.0	17.3	16.8	2.64	73	59	3.8	4.3	16.6	15.8	15.2	0.14	7	17	0.9	0.2	-1.4	-1.5	-1.6			
	2004	109-17	2.62	73	52	3.3	4.2	15.2	14.8	14.4	2.65	73	59	3.8	4.3	15.1	14.5	14.1	0.03	0	7	0.5	0.1	-0.1	-0.3	-0.3			
	2003	109-19	2.63	72	54	3.4	4.2	13.9	13.8	13.5	2.63	71	57	3.6	4.2	14.2	14.0	13.5	0.00	-1	3	0.3	0.0	0.3	0.2	0.0			
5.5	TBA	111-08	2.05	29	9	2.0	3.7	23.0	22.6	21.6	2.71	67	57	3.7	4.2	19.2	17.1	15.9	0.67	37	48	1.7	0.5	-3.8	-5.5	-5.7			
	2008	111-08	2.45	63	40	2.6	4.1	19.7	19.2	18.5	2.93	86	77	4.1	4.5	16.5	15.2	14.2	0.48	23	37	1.6	0.5	-3.2	-4.0	-4.3			
	2007	111-08	2.30	49	28	2.4	3.9	20.9	20.4	19.5	2.81	76	67	3.9	4.3	18.0	16.1	15.0	0.51	27	39	1.5	0.5	-2.9	-4.3	-4.5			
	2006	111-08	2.42	58	38	2.7	4.0	19.5	18.9	18.2	2.83	77	69	3.9	4.3	17.3	15.5	14.5	0.41	20	31	1.3	0.4	-2.2	-3.4	-3.7			
	2005	111-18	2.52	65	47	3.0	4.1	17.0	16.6	16.1	2.78	76	69	4.1	4.4	15.6	14.5	13.8	0.26	10	23	1.0	0.3	-1.4	-2.1	-2.3			
	2004	111-28	2.56	66	50	3.3	4.2	15.3	14.9	14.6	2.74	73	67	4.2	4.4	14.0	13.3	13.0	0.18	7	17	0.9	0.2	-1.3	-1.6	-1.6			
	2003	111-28	2.54	64	50	3.4	4.1	14.4	14.2	13.9	2.66	68	62	4.0	4.3	13.6	13.2	12.8	0.12	4	12	0.7	0.1	-0.8	-1.0	-1.1			
6.0	TBA	113-05	1.78	7	-8	1.7	3.5	24.6	24.2	23.1	2.69	75	61	3.4	4.1	19.1	17.5	16.4	0.92	68	69	1.7	0.7	-5.5	-6.7	-6.7			
	2008	113-05	2.44	60	42	2.6	4.0	19.9	19.4	18.6	2.99	99	87	3.9	4.5	16.1	15.1	14.4	0.56	39	45	1.3	0.5	-3.8	-4.3	-4.2			
	2007	113-05	2.34	51	35	2.5	3.9	20.3	19.9	19.1	2.89	91	79	3.7	4.3	16.9	15.7	14.9	0.55	39	44	1.2	0.5	-3.4	-4.2	-4.2			
	2006	113-05	2.45	59	43	2.7	3.9	19.1	18.7	17.9	2.92	92	82	3.8	4.4	16.1	15.0	14.2	0.47	34	38	1.1	0.4	-3.0	-3.7	-3.7			
6.5	TBA	113-01	2.91	102	90	3.0	3.8	19.1	19.0	18.6	3.28	130	121	3.7	4.1	17.2	16.3	15.7	0.37	27	30	0.7	0.3	-1.9	-2.7	-2.9			
	2008	114-01	2.71	86	72	2.8	4.0	19.5	19.2	18.4	3.23	124	113	3.8	4.4	16.3	15.4	14.7	0.52	38	42	1.0	0.4	-3.2	-3.8	-3.7			
	2007	114-01	2.67	79	68	2.9	3.9	19.1	19.0	18.6	3.06	108	99	3.7	4.2	17.2	16.3	15.7	0.40	29	32	0.7	0.3	-1.9	-2.7	-2.9			
	2006	114-01	2.73	85	73	3.0	3.9	18.3	18.2	17.7	3.10	112	103	3.7	4.2	16.2	15.5	15.0	0.37	27	30	0.7	0.3	-2.1	-2.7	-2.7			

Source: Bloomberg L.P., Barclays

FIGURE 22

IOS, Market Rates: NY 3PM Close of Tue, Jan 10, 2017

Security	Coupon	Price	Prod V1.37								Beta V1.39								Change							
			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 IO	3.0	19-14	2.80	199	1	-14.3	5.4	7.2	7.3	8.0	3.28	237	47	-13.3	5.4	7.0	6.9	7.6	0.48	38	47	1.0	0.0	-0.2	-0.4	-0.4
IFN-33013 IO	3.0	19-24	2.75	190	-1	-14.0	5.5	7.2	7.3	8.0	3.22	228	48	-12.9	5.5	7.0	7.0	7.5	0.48	38	49	1.2	0.0	-0.2	-0.3	-0.5
IFN-33510 IO	3.5	19-19+	1.52	213	-36	-20.2	4.9	10.3	10.2	11.0	2.07	257	16	-19.3	4.9	10.2	9.9	10.5	0.55	43	52	1.0	0.0	-0.1	-0.3	-0.5
IFN-33512 IO	3.5	21-17+	1.71	146	-34	-15.9	5.3	9.1	9.1	9.7	2.09	183	4	-15.5	5.3	9.1	9.0	9.4	0.38	37	37	0.4	0.0	0.0	-0.1	-0.3
IFN-33513 IO	3.5	21-18+	2.02	165	-4	-16.0	5.3	9.1	9.3	9.8	2.43	202	41	-15.1	5.3	9.2	9.1	9.4	0.41	37	45	0.9	0.0	0.1	-0.2	-0.4
IFN-33514 IO	3.5	20-24+	0.85	230	-61	-26.8	5.4	10.6	10.9	11.7	1.09	263	-20	-26.1	5.4	10.9	11.1	11.5	0.24	33	41	0.7	0.0	0.3	0.2	-0.2
IFN-34009 IO	4.0	20-21	0.60	144	-106	-22.5	4.6	12.4	12.4	12.7	1.19	190	-23	-19.1	4.6	12.3	12.0	12.2	0.59	47	83	3.3	0.0	-0.1	-0.4	-0.5
IFN-34010 IO	4.0	22-19	0.69	64	-116	-19.2	5.0	11.6	11.4	11.6	0.86	96	-66	-17.3	5.0	11.8	11.4	11.4	0.17	31	50	1.8	0.0	0.2	0.0	-0.2
IFN-34011 IO	4.0	22-31	1.02	91	-75	-18.0	5.1	11.4	11.2	11.3	1.00	112	-44	-17.2	5.1	11.8	11.4	11.3	-0.02	21	31	0.8	0.0	0.4	0.2	0.0
IFN-34013 IO	4.0	22-06+	1.14	153	-7	-20.2	5.1	12.6	12.6	12.4	1.10	166	28	-19.0	5.1	13.3	12.9	12.4	-0.05	13	35	1.2	0.0	0.7	0.3	0.0
IFN-34014 IO	4.0	22-10+	0.91	166	-20	-23.1	5.2	12.8	12.8	12.7	0.81	178	18	-21.7	5.2	13.4	13.2	12.8	-0.09	12	38	1.4	0.0	0.6	0.4	0.1
IFN-34509 IO	4.5	21-28	-0.32	131	-85	-23.7	4.5	15.3	14.9	14.9	1.02	193	45	-17.3	4.4	14.3	13.9	13.7	1.33	62	130	6.4	-0.1	-1.0	-1.0	-1.2
IFN-34510 IO	4.5	22-12	1.02	179	0	-20.6	4.6	14.3	13.8	13.7	1.96	224	108	-15.1	4.5	13.7	13.1	12.9	0.94	45	108	5.5	0.0	-0.6	-0.7	-0.8
IFN-34511 IO	4.5	23-21+	0.89	129	-42	-19.5	4.8	13.7	13.3	13.1	1.54	160	46	-14.8	4.8	13.4	12.8	12.5	0.65	31	88	4.7	0.0	-0.3	-0.5	-0.6
IFN-35003 IO	5.0	21-07	1.13	93	25	-7.2	3.6	14.2	14.1	13.7	1.11	79	47	-5.3	3.6	14.5	14.2	13.7	-0.03	-14	22	1.9	0.0	0.3	0.1	0.0
IFN-35005 IO	5.0	23-26+	-3.86	-325	-360	-13.2	4.3	18.3	17.6	17.0	-2.03	-225	-197	-6.2	4.2	16.9	16.0	15.4	1.83	100	163	6.9	0.0	-1.4	-1.6	-1.6
IFN-35008 IO	5.0	21-05+	-2.87	-133	-126	-19.0	4.1	20.7	20.5	19.8	0.37	43	117	-9.4	4.0	18.5	17.9	16.9	3.24	175	243	9.6	-0.1	-2.2	-2.6	-2.9
IFN-35009 IO	5.0	22-03	-0.26	160	38	-20.2	4.2	17.9	17.4	17.0	2.14	279	249	-10.6	4.1	16.0	15.4	14.9	2.39	119	212	9.6	-0.1	-1.9	-2.0	-2.1
IFN-35010 IO	5.0	23-01+	0.06	145	22	-19.1	4.3	17.0	16.4	16.1	1.83	235	194	-11.2	4.3	15.6	15.0	14.5	1.77	90	172	8.0	0.0	-1.4	-1.4	-1.6
IFN-35503 IO	5.5	25-09+	-1.46	-212	-228	-5.0	3.9	14.8	14.6	14.3	-0.39	-173	-138	-0.5	3.8	14.1	13.6	13.3	1.08	39	90	4.4	0.0	-0.7	-1.0	-1.0
IFN-35505 IO	5.5	26-11	-3.47	-364	-362	-9.7	4.3	17.8	17.3	16.7	-0.60	-215	-154	-1.9	4.2	15.9	14.9	14.2	2.87	149	208	7.8	-0.1	-1.9	-2.4	-2.5
IFN-35508 IO	5.5	22-28	-1.97	-160	-96	-15.1	4.1	20.7	20.3	19.5	3.50	162	255	-3.6	3.9	17.0	15.7	14.7	5.46	322	351	11.5	-0.2	-3.7	-4.6	-4.8
IFN-36008 IO	6.0	24-25	-1.62	-191	-117	-12.0	4.0	21.1	20.5	19.6	3.99	272	292	-3.4	3.8	16.4	15.5	14.7	5.61	463	408	8.6	-0.2	-4.7	-5.0	-4.9
IFN-36567 IO	6.5	26-14	-1.03	-189	-138	-6.8	3.8	19.9	19.7	19.1	2.79	140	156	-2.1	3.7	17.2	16.4	15.8	3.82	329	294	4.8	-0.1	-2.7	-3.3	-3.3
IG2-34010 IO	4.0	19-14	1.21	182	115	-17.3	4.7	15.7	15.3	13.9	0.91	103	90	-18.8	4.7	16.2	15.6	14.2	-0.30	-79	-24	-1.5	0.0	0.5	0.3	0.3
IG2-34510 IO	4.5	20-15	1.64	124	157	-14.5	4.5	17.0	16.5	14.9	0.68	56	87	-18.8	4.5	18.6	17.6	15.7	-0.96	-67	-69	-4.3	0.1	1.6	1.1	0.8
IG2-35010 IO	5.0	22-09	2.39	152	187	-12.7	4.4	16.9	16.3	14.7	1.14	71	137	-13.4	4.4	18.8	17.8	15.8	-1.25	-82	-50	-0.8	0.1	1.9	1.5	1.1

Source: Bloomberg L.P., Barclays



FIGURE 23

FN 15Y, Market Rates: NY 3PM Close of Tue, Jan 10, 2017

Coupon	Vintage	Price	Prod V1.37								Beta V1.39								Change							
			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	100-15+	2.37	32	15	4.1	4.5	6.5	7.2	7.9	2.37	32	16	4.2	4.5	7.0	7.6	8.2	0.00	0	1	0.0	0.0	0.5	0.4	0.3
	2016	100-16+	2.38	29	12	4.6	4.9	4.1	5.7	6.9	2.38	29	13	4.6	4.9	4.5	6.0	7.1	0.00	0	1	0.0	0.0	0.4	0.3	0.2
	2015	100-16+	2.37	32	17	4.2	4.5	6.3	7.0	7.8	2.36	32	18	4.3	4.5	6.8	7.3	8.1	0.00	0	1	0.1	0.0	0.5	0.3	0.3
	2014	100-17+	2.35	33	19	4.0	4.2	7.4	7.8	8.5	2.35	33	20	4.0	4.2	7.7	8.0	8.7	0.00	0	1	0.0	0.0	0.3	0.2	0.2
	2013	100-18+	2.32	36	29	3.8	3.9	7.7	8.3	9.1	2.32	36	29	3.8	3.9	7.8	8.3	9.2	0.00	0	0	0.0	0.0	0.1	0.0	0.1
	2012	100-18+	2.31	38	31	3.5	3.7	8.0	8.6	9.4	2.31	38	31	3.5	3.7	8.1	8.7	9.5	0.00	0	0	0.0	0.0	0.1	0.1	0.1
3.0	TBA	102-28	2.32	30	7	3.6	4.3	8.5	9.0	9.5	2.32	30	11	3.8	4.3	8.6	8.9	9.4	0.00	0	4	0.2	0.1	0.1	-0.1	-0.1
	2016	102-28	2.38	33	16	4.3	4.7	5.5	7.1	8.3	2.38	33	18	4.4	4.8	5.5	7.1	8.3	0.00	0	2	0.2	0.0	0.0	0.0	0.0
	2015	102-28	2.33	31	14	3.9	4.4	7.7	8.3	9.0	2.33	31	17	4.1	4.4	7.5	8.1	8.9	0.00	0	2	0.2	0.0	-0.2	-0.2	-0.1
	2014	102-28	2.28	29	16	3.7	4.1	8.5	8.7	9.5	2.28	29	16	3.8	4.1	8.4	8.7	9.5	0.00	0	0	0.0	0.0	-0.1	0.0	0.0
	2013	102-31	2.20	25	16	3.6	3.9	8.6	9.2	9.9	2.20	25	15	3.6	3.9	8.8	9.3	10.1	-0.01	0	-1	0.0	0.0	0.2	0.1	0.2
	2012	103-01	2.09	19	12	3.3	3.5	9.4	10.1	10.6	2.09	19	12	3.3	3.5	9.5	10.3	10.8	-0.01	0	0	0.0	0.0	0.1	0.2	0.2
	2011	103-01	2.05	17	10	3.1	3.3	9.6	10.4	10.8	2.04	17	9	3.0	3.3	9.7	10.5	11.0	-0.01	0	0	0.0	0.0	0.1	0.1	0.2
3.5	TBA	104-11+	0.44	-102	-103	1.4	1.5	15.1	15.1	15.0	0.39	-106	-108	1.4	1.5	15.6	19.8	16.5	-0.05	-4	-4	-0.1	0.0	0.5	4.7	1.5
	2015	104-11+	2.46	46	35	4.0	4.3	8.1	8.9	9.8	2.45	45	36	4.1	4.3	8.4	9.1	10.0	-0.01	-1	1	0.1	0.0	0.3	0.2	0.2
	2014	104-14+	2.36	39	29	3.7	4.0	9.3	9.7	10.4	2.35	38	29	3.7	4.0	9.6	10.0	10.6	-0.01	-1	0	0.0	0.0	0.3	0.3	0.2
	2013	104-14+	2.30	35	27	3.6	3.8	9.5	9.9	10.6	2.29	35	26	3.5	3.8	9.9	10.3	10.9	-0.01	-1	-1	-0.1	0.0	0.4	0.4	0.3
	2012	104-15+	2.13	24	19	3.2	3.4	10.2	11.0	11.4	2.12	24	20	3.2	3.4	10.4	11.0	11.6	-0.01	0	0	0.0	0.0	0.2	0.0	0.2
	2011	104-17+	2.03	17	10	2.9	3.2	10.9	11.5	11.8	2.01	16	9	2.8	3.1	11.4	11.9	12.3	-0.02	-1	-1	0.0	0.0	0.5	0.4	0.5
	2010	104-15+	1.92	11	4	2.6	2.9	11.6	12.3	12.4	1.90	10	3	2.6	2.9	12.1	12.7	13.0	-0.02	-1	-1	-0.1	0.0	0.5	0.4	0.6
4.0	TBA	102-22	2.96	115	110	2.6	2.8	12.5	13.3	13.3	2.96	115	111	2.6	2.8	12.7	13.3	13.6	-0.01	0	1	0.0	0.0	0.2	0.0	0.3
	2011	104-08	2.54	70	64	2.8	3.0	11.8	12.4	12.7	2.53	70	64	2.8	3.0	12.2	12.6	12.9	-0.01	-1	0	0.0	0.0	0.4	0.2	0.2
	2010	103-30	2.53	73	67	2.5	2.8	12.5	13.2	13.2	2.52	72	67	2.6	2.8	12.9	13.3	13.6	-0.01	-1	0	0.0	0.0	0.4	0.1	0.4
	2009	103-20	2.49	74	68	2.3	2.5	13.5	14.1	14.0	2.48	73	69	2.3	2.5	13.8	14.2	14.4	-0.01	-1	1	0.0	0.0	0.3	0.1	0.4
4.5	TBA	102-22	3.08	141	138	1.9	2.1	15.4	15.4	15.3	3.07	140	138	2.0	2.1	15.2	15.8	15.8	-0.01	-1	0	0.0	0.0	-0.2	0.4	0.5
	2010	104-06	2.87	109	103	2.5	2.7	13.4	14.1	14.0	2.88	109	105	2.6	2.7	13.2	13.8	14.0	0.00	0	2	0.1	0.0	-0.2	-0.3	0.0
	2009	104-06	2.73	99	94	2.2	2.5	14.3	14.9	14.8	2.74	99	96	2.4	2.5	13.8	14.5	14.7	0.01	0	3	0.1	0.0	-0.5	-0.4	-0.1

Source: Bloomberg L.P., Barclays

FIGURE 24

FN 20Y, Market Rates: NY 3PM Close of Tue, Jan 10, 2017

			Prod V1.37								Beta V1.39								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	101-11	2.72	60	23	4.5	5.2	6.9	7.6	9.6	2.72	60	28	4.8	5.3	7.7	8.3	9.7	0.00	0	6	0.3	0.1	0.8	0.7	0.1
	2016	101-11	2.76	59	22	4.8	5.7	3.7	5.0	7.4	2.76	59	27	5.2	5.8	3.9	5.4	7.5	0.00	0	6	0.4	0.1	0.2	0.4	0.1
	2015	101-11	2.72	60	23	4.5	5.1	7.0	7.7	9.7	2.72	60	28	4.8	5.2	7.8	8.4	9.8	0.00	0	6	0.3	0.1	0.8	0.7	0.1
	2014	101-11	2.70	61	26	4.4	4.9	8.5	9.1	10.6	2.70	61	30	4.6	5.0	8.8	9.2	10.4	0.00	0	5	0.3	0.1	0.3	0.1	-0.2
	2013	101-11	2.71	62	42	4.6	5.0	6.6	7.7	8.5	2.71	62	41	4.6	4.9	7.0	8.1	9.0	-0.01	0	0	0.0	-0.1	0.4	0.4	0.5
	2012	101-11	2.69	63	40	4.3	4.7	7.5	8.8	9.3	2.69	63	41	4.4	4.7	7.9	9.0	9.6	0.00	0	1	0.1	0.0	0.4	0.2	0.3
3.5	TBA	104-07+	2.63	58	21	4.0	5.0	9.3	9.7	10.6	2.64	59	28	4.5	5.2	8.5	9.2	10.2	0.02	0	8	0.5	0.2	-0.8	-0.5	-0.4
	2016	104-07+	2.69	62	21	4.1	5.4	6.5	8.2	9.6	2.71	63	30	4.8	5.6	5.8	7.5	9.1	0.02	0	9	0.7	0.2	-0.7	-0.7	-0.5
	2015	104-07+	2.65	59	24	4.1	5.1	8.8	9.2	10.1	2.65	59	30	4.6	5.2	8.3	8.9	9.9	0.01	0	6	0.4	0.1	-0.5	-0.3	-0.2
	2014	104-07+	2.57	55	20	3.8	4.7	11.1	11.3	11.5	2.57	55	24	4.1	4.8	10.6	11.1	11.5	0.00	0	5	0.3	0.1	-0.5	-0.2	0.0
	2013	104-07+	2.61	56	32	4.3	4.9	8.4	9.2	9.7	2.58	55	31	4.2	4.8	9.2	9.9	10.5	-0.03	-1	-2	-0.1	-0.1	0.8	0.7	0.8
	2012	104-23+	2.42	42	18	3.8	4.5	9.8	10.4	10.5	2.41	42	19	3.9	4.5	10.0	10.6	10.9	-0.01	-1	1	0.1	0.0	0.2	0.2	0.4
	2011	104-07+	2.47	49	25	3.5	4.3	11.8	11.5	11.5	2.46	49	26	3.6	4.3	11.4	11.6	11.8	-0.01	0	1	0.1	0.0	-0.4	0.1	0.3
	2010	104-07+	2.44	47	27	3.5	4.1	11.6	11.0	11.3	2.42	46	27	3.5	4.1	11.8	11.5	11.8	-0.02	-1	0	0.0	0.0	0.2	0.5	0.5
4.0	TBA	106-19+	2.39	44	21	3.3	4.2	12.3	11.7	11.8	2.36	42	22	3.5	4.2	12.5	12.3	12.4	-0.03	-2	1	0.2	0.0	0.2	0.6	0.6
	2016	106-19+	2.72	68	34	4.2	5.3	7.8	9.1	10.0	2.73	68	40	4.7	5.4	7.2	8.8	10.0	0.00	0	6	0.5	0.1	-0.6	-0.3	0.0
	2015	106-19+	2.70	64	36	4.2	5.1	8.7	9.1	10.0	2.68	63	39	4.5	5.2	8.8	9.5	10.3	-0.02	-1	3	0.3	0.0	0.1	0.4	0.3
	2014	106-19+	2.61	58	32	4.0	4.8	10.0	10.2	10.7	2.56	55	32	4.2	4.8	10.8	11.1	11.5	-0.04	-3	0	0.2	-0.1	0.8	0.9	0.8
	2013	106-19+	2.58	56	32	4.0	4.7	9.9	10.4	10.8	2.52	52	30	4.0	4.6	11.3	11.6	11.8	-0.06	-4	-2	0.0	-0.1	1.4	1.2	1.0
	2012	107-03+	2.41	40	21	3.8	4.5	9.6	10.0	10.4	2.36	38	20	3.9	4.4	10.5	10.8	11.1	-0.04	-3	-1	0.0	-0.1	0.9	0.8	0.7
	2011	106-27+	2.35	39	16	3.3	4.2	12.0	11.5	11.6	2.31	37	17	3.5	4.2	12.4	12.1	12.3	-0.04	-3	1	0.2	0.0	0.4	0.6	0.7
	2010	106-19+	2.34	40	19	3.2	4.0	12.0	11.4	11.7	2.29	37	19	3.3	4.0	12.7	12.2	12.5	-0.04	-3	-1	0.1	0.0	0.7	0.8	0.8
	2009	106-19+	2.22	31	15	3.1	3.8	11.1	11.3	11.9	2.19	29	16	3.3	3.7	11.7	11.8	12.3	-0.03	-2	1	0.1	0.0	0.6	0.5	0.4
4.5	TBA	107-24	2.52	61	38	3.0	4.0	13.6	12.7	12.8	2.50	60	43	3.4	4.0	13.6	12.9	13.0	-0.02	-2	5	0.5	0.0	0.0	0.2	0.2
	2011	108-24	2.30	40	16	2.9	4.0	13.2	12.4	12.7	2.28	38	21	3.4	4.1	13.4	12.8	12.9	-0.02	-2	5	0.5	0.0	0.2	0.4	0.2
	2010	107-24	2.45	56	35	2.9	3.8	12.9	12.4	12.8	2.43	53	39	3.3	3.9	13.3	12.7	13.0	-0.02	-2	5	0.4	0.0	0.4	0.3	0.2
	2009	107-24	2.38	49	31	2.9	3.7	12.0	12.1	12.6	2.38	48	37	3.3	3.7	12.2	12.2	12.6	0.00	-1	6	0.4	0.1	0.2	0.1	0.0
5.0	TBA	109-03	1.99	24	12	2.5	3.1	14.2	14.7	15.0	2.10	28	24	2.9	3.2	12.8	13.2	13.6	0.11	5	12	0.5	0.1	-1.4	-1.5	-1.4
	2003	109-03	0.91	-71	-76	1.9	2.3	16.0	16.0	16.0	0.98	-68	-69	2.1	2.3	14.6	15.0	15.1	0.07	3	7	0.3	0.0	-1.4	-1.0	-0.9
5.5	TBA	111-29	1.19	-53	-57	2.3	2.8	15.3	15.8	15.8	1.46	-35	-35	2.9	3.0	12.4	12.9	13.1	0.27	18	22	0.6	0.1	-2.9	-2.9	-2.7
	2003	111-29	0.22	-139	-142	1.9	2.3	16.4	16.3	16.3	0.42	-126	-126	2.3	2.4	13.7	14.1	14.2	0.20	14	16	0.4	0.1	-2.7	-2.2	-2.1

Source: Bloomberg L.P., Barclays

FIGURE 25

GN2 30Y, Market Rates: NY 3PM Close of Tue, Jan 10, 2017

			Prod V1.37									Beta V1.39									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	101-06	2.81	59	14	5.0	6.2	4.9	7.3	9.2	2.79	59	9	5.0	6.0	7.6	9.1	10.3	-0.02	0	-4	0.0	-0.2	2.7	1.8	1.1			
	2016	101-06	2.81	59	16	5.1	6.2	5.0	7.3	8.9	2.80	58	11	5.1	6.1	7.4	8.7	9.9	-0.01	0	-5	0.0	-0.2	2.4	1.4	1.0			
	2015	101-09	2.78	57	16	5.2	6.0	8.0	8.9	9.8	2.77	57	11	5.0	5.8	9.9	10.3	10.7	-0.01	0	-5	-0.2	-0.2	1.9	1.4	0.9			
	2014	101-14	2.74	56	13	5.2	5.8	9.7	10.7	10.9	2.73	55	10	5.0	5.6	12.5	12.2	11.3	-0.01	-1	-4	-0.2	-0.2	2.8	1.5	0.4			
	2013	101-16	2.72	54	17	5.3	5.7	11.4	11.5	10.9	2.71	54	15	5.2	5.7	12.3	12.0	11.0	0.00	0	-2	-0.1	-0.1	0.9	0.5	0.1			
	2012	101-22	2.67	51	14	5.2	5.6	12.2	12.1	11.3	2.68	51	13	5.1	5.6	12.5	12.1	11.1	0.00	0	-1	0.0	0.0	0.3	0.0	-0.2			
3.5	TBA	103-26	2.75	68	16	4.1	5.5	10.7	11.5	12.9	2.66	63	8	3.8	5.1	15.9	15.3	14.7	-0.08	-5	-8	-0.4	-0.4	5.2	3.8	1.8			
	2016	103-26	2.79	70	18	4.2	5.7	8.1	10.2	11.9	2.68	64	9	3.8	5.2	14.9	15.0	14.4	-0.11	-5	-9	-0.4	-0.5	6.8	4.8	2.5			
	2015	103-28	2.74	67	17	4.2	5.5	10.5	11.4	12.7	2.67	62	9	3.9	5.2	15.2	14.8	14.3	-0.08	-5	-8	-0.4	-0.4	4.7	3.4	1.6			
	2014	104-04	2.66	58	11	4.1	5.3	13.1	13.7	13.3	2.58	56	5	3.9	5.0	16.8	16.3	14.8	-0.07	-3	-6	-0.3	-0.2	3.7	2.6	1.5			
	2013	104-10	2.61	55	13	4.4	5.4	13.8	14.2	13.2	2.61	54	12	4.4	5.3	14.4	14.3	13.1	0.01	-1	-1	0.0	0.0	0.6	0.1	-0.1			
	2012	104-14	2.57	52	12	4.4	5.3	14.8	14.4	13.3	2.58	51	11	4.4	5.3	14.6	14.1	13.0	0.02	0	0	0.0	0.0	-0.2	-0.3	-0.3			
	2011	104-17	2.54	48	10	4.3	5.2	14.8	14.5	13.4	2.52	47	6	4.1	5.1	15.9	15.2	13.7	-0.02	0	-4	-0.2	-0.1	1.1	0.7	0.3			
4.0	TBA	105-25	2.75	72	29	3.9	5.0	15.2	15.1	14.3	2.51	59	16	3.4	4.5	21.1	20.3	17.9	-0.24	-13	-13	-0.5	-0.5	5.9	5.2	3.6			
	2016	105-25	2.81	78	30	3.4	5.2	13.2	13.8	13.8	2.66	70	24	3.5	4.9	17.1	17.3	16.0	-0.15	-9	-6	0.1	-0.3	3.9	3.5	2.2			
	2015	105-28	2.71	71	22	3.2	4.9	15.1	14.8	14.9	2.52	61	11	3.0	4.6	20.4	19.5	17.8	-0.20	-11	-11	-0.2	-0.3	5.3	4.7	2.9			
	2014	105-31	2.75	70	29	4.0	5.1	14.5	14.5	13.7	2.55	59	19	3.6	4.7	19.9	19.0	16.6	-0.20	-11	-10	-0.4	-0.4	5.4	4.5	2.9			
	2013	106-05	2.65	61	20	3.7	4.9	16.2	15.9	14.6	2.54	57	18	3.6	4.8	19.4	18.3	16.1	-0.11	-4	-3	-0.1	-0.1	3.2	2.4	1.5			
	2012	106-13	2.69	62	31	4.5	5.3	14.8	14.2	12.8	2.60	56	26	4.3	5.0	16.7	15.8	14.2	-0.09	-6	-5	-0.2	-0.3	1.9	1.6	1.4			
	2011	106-23	2.55	50	16	3.9	5.0	15.8	15.3	13.9	2.47	47	14	3.9	4.9	17.8	16.8	15.0	-0.08	-3	-2	-0.1	-0.1	2.0	1.5	1.1			
	2010	106-29	2.48	50	13	3.7	5.0	15.8	15.4	14.1	2.47	47	10	3.6	4.9	16.3	15.7	14.3	-0.02	-3	-3	-0.2	0.0	0.5	0.3	0.2			
4.5	TBA	106-24	2.84	89	50	3.3	4.5	19.2	18.4	16.9	2.60	73	40	3.2	4.2	23.8	22.3	19.9	-0.24	-16	-10	-0.2	-0.3	4.6	3.9	3.0			
	2014	107-08	2.83	84	47	3.6	4.7	18.0	17.2	15.6	2.67	74	43	3.6	4.5	20.8	19.6	17.6	-0.16	-11	-4	0.0	-0.2	2.8	2.4	2.0			
	2013	107-24	2.70	72	37	3.5	4.7	17.9	17.4	15.7	2.58	63	35	3.6	4.6	20.3	19.3	17.1	-0.12	-9	-2	0.1	-0.1	2.4	1.9	1.4			
	2011	108-24	2.59	57	26	3.6	4.9	16.3	15.7	14.1	2.48	50	25	3.8	4.8	18.4	17.3	15.3	-0.11	-7	-1	0.2	-0.1	2.1	1.6	1.2			
	2010	109-00	2.46	48	18	3.4	4.8	16.9	16.4	14.9	2.40	45	13	3.2	4.7	18.1	17.2	15.5	-0.06	-3	-5	-0.3	-0.1	1.2	0.8	0.6			
	2009	108-20	2.49	52	21	3.3	4.7	17.3	16.7	15.2	2.42	48	16	3.0	4.6	18.5	17.6	15.8	-0.06	-4	-5	-0.3	-0.1	1.2	0.9	0.6			
5.0	TBA	107-19	3.09	111	90	3.7	4.3	18.1	17.7	16.2	3.09	110	93	4.0	4.3	18.4	17.7	16.2	0.00	-1	3	0.3	0.1	0.3	0.0	0.0			
	2010	109-27	2.77	77	50	3.4	4.7	16.7	16.1	14.6	2.66	71	48	3.5	4.6	18.4	17.5	15.7	-0.11	-7	-2	0.2	-0.1	1.7	1.4	1.1			
	2009	109-07	2.80	82	54	3.2	4.5	17.5	17.0	15.5	2.68	76	52	3.3	4.4	19.5	18.5	16.7	-0.12	-7	-2	0.1	-0.1	2.0	1.5	1.2			
	2005	109-23	2.74	75	57	3.7	4.4	15.4	14.6	13.3	2.71	70	59	4.0	4.4	15.8	14.9	13.7	-0.04	-5	1	0.3	0.0	0.4	0.3	0.4			
	2004	109-31	2.80	77	66	4.2	4.6	12.5	12.1	11.3	2.70	68	59	4.1	4.5	14.1	13.4	12.5	-0.11	-9	-7	-0.1	-0.1	1.6	1.3	1.2			

# Bloomberg

			Prod V1.37								Beta V1.39								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
	2003	110-11	2.72	69	60	4.2	4.6	11.5	11.2	10.6	2.60	59	50	4.1	4.4	13.4	12.7	11.9	-0.12	-10	-9	-0.1	-0.2	1.9	1.5	1.3
5.5	TBA	111-08	2.57	64	46	3.1	4.1	19.5	19.0	17.5	2.75	75	64	3.9	4.3	17.6	17.0	15.9	0.19	11	18	0.7	0.2	-1.9	-2.0	-1.6
	2008	112-02	2.38	47	29	3.1	4.1	19.4	18.9	17.4	2.58	58	48	3.9	4.3	17.6	17.0	15.9	0.20	12	19	0.8	0.2	-1.8	-1.9	-1.5
	2005	113-00	2.55	57	42	3.7	4.5	14.9	14.4	13.1	2.57	54	47	4.2	4.5	14.6	14.1	13.0	0.02	-3	5	0.6	0.0	-0.3	-0.3	-0.1
	2004	113-24	2.54	51	42	4.2	4.7	12.5	12.0	11.2	2.42	39	33	4.2	4.5	13.8	13.1	12.2	-0.12	-12	-9	0.1	-0.1	1.3	1.1	1.0
	2003	114-00	2.46	44	36	4.2	4.6	11.9	11.5	10.8	2.31	29	24	4.1	4.4	13.5	12.9	12.1	-0.15	-14	-11	0.0	-0.2	1.6	1.4	1.3
6.0	TBA	113-01	2.78	81	70	3.5	4.2	17.7	16.9	15.5	2.90	88	82	4.0	4.3	16.4	15.7	14.6	0.12	7	12	0.5	0.1	-1.3	-1.2	-0.9
	2008	113-01	2.62	69	56	3.3	4.1	19.1	18.9	17.4	2.86	84	76	3.9	4.3	17.3	16.8	15.7	0.24	15	20	0.6	0.2	-1.8	-2.1	-1.7
	2007	113-15	2.52	59	46	3.2	4.1	19.3	18.6	17.1	2.74	73	65	3.8	4.3	17.5	16.7	15.5	0.21	14	19	0.6	0.2	-1.8	-1.9	-1.6
	2006	113-29	2.59	62	51	3.4	4.2	17.7	17.0	15.6	2.72	70	64	4.0	4.3	16.5	15.7	14.6	0.14	8	13	0.5	0.1	-1.2	-1.3	-1.0
	2004	114-31	2.75	72	64	4.2	4.6	12.7	12.2	11.4	2.62	59	55	4.3	4.5	13.7	13.1	12.3	-0.13	-13	-9	0.1	-0.1	1.0	0.9	0.9
	2003	115-17	2.62	59	52	4.2	4.6	12.1	11.8	11.0	2.45	43	40	4.2	4.4	13.4	13.0	12.3	-0.16	-16	-13	0.0	-0.2	1.3	1.2	1.3
6.5	TBA	113-04+	3.32	133	123	3.6	4.2	16.5	15.8	14.4	3.45	140	136	4.2	4.4	14.9	14.3	13.4	0.14	8	13	0.6	0.1	-1.6	-1.5	-1.0
	2008	113-12+	3.02	106	97	3.4	4.0	18.9	18.6	17.2	3.21	119	112	3.9	4.2	17.6	17.1	15.9	0.19	13	16	0.5	0.2	-1.3	-1.5	-1.3

Source: Bloomberg L.P., Barclays

FIGURE 26

GN 30Y, Market Rates: NY 3PM Close of Tue, Jan 10, 2017

			Prod V1.37									Beta V1.39									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	101-04	2.78	61	23	5.2	5.5	12.9	12.8	11.9	2.78	61	21	5.1	5.5	13.4	12.9	11.8	0.00	0	-2	-0.1	-0.1	0.5	0.1	-0.1			
	2015	101-08	2.79	58	19	5.5	6.1	8.3	9.2	9.9	2.79	58	15	5.4	6.1	9.4	10.1	10.2	0.00	0	-4	-0.1	0.0	1.1	0.9	0.3			
	2013	101-14	2.72	56	18	5.2	5.6	12.9	12.7	11.7	2.73	56	16	5.2	5.6	13.1	12.6	11.5	0.00	0	-2	-0.1	0.0	0.2	-0.1	-0.2			
	2012	101-18	2.70	54	18	5.3	5.7	12.4	12.2	11.2	2.71	54	16	5.3	5.7	12.5	12.0	10.9	0.00	0	-2	0.0	0.0	0.1	-0.2	-0.3			
3.5	TBA	103-27	2.69	61	22	4.5	5.1	15.0	14.6	13.5	2.66	60	17	4.2	5.0	16.2	15.6	14.2	-0.03	-1	-5	-0.3	-0.1	1.2	1.0	0.7			
	2015	103-27	2.77	67	24	4.8	5.7	11.2	11.9	12.1	2.73	64	18	4.5	5.5	13.9	13.8	13.0	-0.04	-2	-7	-0.3	-0.2	2.7	1.9	0.9			
	2014	103-31	2.74	63	23	4.8	5.5	12.7	12.8	12.1	2.72	62	18	4.6	5.5	14.7	14.1	12.7	-0.02	-1	-5	-0.2	-0.1	2.0	1.3	0.6			
	2013	104-05	2.71	60	26	5.0	5.6	13.2	12.9	11.7	2.71	60	26	5.1	5.7	13.0	12.6	11.6	0.01	1	1	0.1	0.1	-0.2	-0.3	-0.1			
	2012	104-11	2.63	53	19	4.8	5.4	14.2	13.7	12.5	2.61	53	16	4.6	5.3	14.8	14.1	12.9	-0.02	0	-3	-0.2	-0.1	0.6	0.4	0.4			
	2011	104-13	2.59	51	15	4.5	5.2	14.6	14.1	13.0	2.55	50	9	4.2	5.0	16.1	15.3	13.9	-0.04	-1	-6	-0.4	-0.2	1.5	1.2	0.9			
4.0	TBA	105-24	2.72	68	32	3.9	4.8	16.2	15.7	14.4	2.56	60	21	3.4	4.4	20.4	19.2	17.0	-0.17	-8	-11	-0.5	-0.3	4.2	3.5	2.6			
	2015	105-24	2.68	68	23	3.1	4.7	18.4	16.8	15.9	2.64	65	24	3.6	4.7	19.0	18.0	16.5	-0.04	-3	1	0.5	0.0	0.6	1.2	0.6			
	2014	105-28	2.90	78	46	4.8	5.5	13.3	12.9	11.7	2.83	75	40	4.6	5.4	15.1	14.5	12.8	-0.07	-3	-6	-0.2	-0.2	1.8	1.6	1.1			
	2013	106-00	2.90	77	49	5.1	5.7	13.0	12.5	11.1	2.85	75	45	5.0	5.6	13.7	13.3	11.9	-0.05	-2	-4	-0.1	-0.1	0.7	0.8	0.8			
	2012	106-06	2.83	71	46	5.0	5.5	13.8	12.8	11.4	2.73	64	39	4.8	5.2	15.8	14.7	13.1	-0.11	-7	-7	-0.2	-0.3	2.0	1.9	1.7			
	2011	106-20	2.63	56	25	4.3	5.1	14.9	14.4	13.1	2.52	51	16	3.9	4.9	17.4	16.5	14.7	-0.11	-5	-9	-0.4	-0.3	2.5	2.1	1.6			
	2010	106-26	2.54	53	19	4.0	5.1	15.4	14.9	13.6	2.49	49	9	3.5	4.9	16.5	15.8	14.4	-0.06	-4	-10	-0.5	-0.2	1.1	0.9	0.8			
4.5	TBA	108-02	2.63	64	28	3.2	4.6	18.0	17.1	15.4	2.37	47	16	3.0	4.3	23.5	21.2	18.4	-0.27	-17	-13	-0.2	-0.3	5.5	4.1	3.0			
	2011	108-10	2.83	75	47	4.2	5.2	14.8	13.9	12.5	2.64	63	36	3.9	4.8	18.4	16.9	14.7	-0.20	-12	-12	-0.3	-0.3	3.6	3.0	2.2			
	2010	108-14	2.68	65	38	3.9	5.0	15.6	15.2	13.8	2.55	58	23	3.2	4.7	17.8	16.8	15.2	-0.13	-7	-14	-0.7	-0.3	2.2	1.6	1.4			
	2009	108-12	2.58	59	31	3.5	4.7	16.6	16.2	14.8	2.47	52	18	2.9	4.5	18.5	17.6	16.0	-0.11	-7	-13	-0.6	-0.2	1.9	1.4	1.2			
5.0	TBA	109-17	2.55	61	42	3.4	4.1	19.3	18.9	17.3	2.62	65	49	3.8	4.3	18.8	18.0	16.6	0.07	4	8	0.4	0.1	-0.5	-0.9	-0.7			
	2010	110-15	2.87	81	59	4.1	5.1	14.5	14.0	12.6	2.70	70	49	4.0	4.9	17.0	16.0	14.2	-0.18	-11	-10	-0.2	-0.2	2.5	2.0	1.6			
	2009	110-07	2.65	64	41	3.4	4.6	16.8	16.4	15.0	2.54	58	38	3.5	4.5	18.5	17.7	16.0	-0.10	-6	-3	0.1	-0.1	1.7	1.3	1.0			
	2005	111-02	2.56	53	39	3.9	4.6	14.0	13.4	12.4	2.48	46	35	4.0	4.5	15.1	14.2	13.1	-0.08	-7	-4	0.1	-0.1	1.1	0.8	0.7			
	2004	111-11	2.56	51	43	4.3	4.7	12.0	11.6	10.9	2.44	42	33	4.1	4.5	13.6	13.0	12.1	-0.12	-9	-10	-0.2	-0.2	1.6	1.4	1.2			
	2003	111-15	2.52	48	40	4.3	4.6	11.3	10.9	10.4	2.38	36	28	4.0	4.4	13.3	12.6	11.8	-0.14	-12	-12	-0.3	-0.2	2.0	1.7	1.4			
5.5	TBA	111-14	2.49	58	41	3.1	4.0	19.9	19.4	17.8	2.69	70	58	3.7	4.2	18.1	17.4	16.2	0.19	12	17	0.6	0.2	-1.8	-2.0	-1.6			
	2008	111-14	2.67	72	56	3.5	4.2	18.1	17.7	16.3	2.77	77	64	3.9	4.4	17.3	16.7	15.5	0.10	5	9	0.4	0.1	-0.8	-1.0	-0.8			
	2005	112-10	2.80	77	66	4.1	4.6	13.9	13.3	12.2	2.78	74	67	4.4	4.6	14.1	13.4	12.4	-0.01	-4	1	0.3	0.0	0.2	0.1	0.2			
	2004	113-06	2.71	66	59	4.4	4.7	12.0	11.5	10.8	2.59	56	50	4.3	4.6	13.3	12.6	11.8	-0.12	-11	-9	0.0	-0.1	1.3	1.1	1.0			

# Bloomberg

Coupon	Vintage	Price	Prod V1.37								Beta V1.39								Change							
			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
	2003	113-12	2.59	56	50	4.2	4.6	11.6	11.2	10.6	2.46	44	39	4.2	4.4	13.1	12.5	11.7	-0.14	-12	-11	-0.1	-0.2	1.5	1.3	1.1
6.0	TBA	112-21	2.88	90	79	3.6	4.2	17.8	17.5	16.3	3.03	101	92	4.1	4.4	16.6	16.1	15.0	0.16	10	13	0.4	0.2	-1.2	-1.4	-1.3
	2008	112-21	2.88	90	80	3.6	4.2	17.7	17.5	16.3	3.03	101	92	4.1	4.4	16.5	16.1	15.0	0.16	10	13	0.4	0.2	-1.2	-1.4	-1.3
	2007	112-21	2.89	92	80	3.6	4.2	17.6	17.1	15.8	3.01	99	91	3.9	4.3	16.6	16.0	14.8	0.12	7	10	0.4	0.1	-1.0	-1.1	-1.0
	2006	112-25	2.96	97	86	3.7	4.3	16.4	15.7	14.5	3.04	101	94	4.1	4.4	15.8	15.0	13.9	0.07	4	7	0.3	0.1	-0.6	-0.7	-0.6
	2004	114-01	2.97	92	86	4.3	4.6	12.3	11.8	11.1	2.86	81	78	4.3	4.5	13.3	12.7	12.0	-0.11	-11	-9	0.0	-0.1	1.0	0.9	0.9
	2003	114-17	2.83	79	74	4.3	4.5	11.8	11.3	10.7	2.68	65	62	4.2	4.4	13.0	12.5	11.9	-0.15	-14	-12	-0.1	-0.2	1.2	1.2	1.2
6.5	TBA	112-19+	3.75	169	164	4.3	4.5	11.8	11.2	10.5	3.67	162	158	4.4	4.4	12.5	11.8	11.2	-0.08	-7	-6	0.0	-0.1	0.7	0.6	0.7
	2008	112-19+	3.51	148	141	4.0	4.3	16.2	16.1	15.0	3.61	155	149	4.3	4.4	15.5	15.2	14.3	0.09	6	8	0.3	0.1	-0.7	-0.9	-0.7

Source: Bloomberg L.P., Barclays

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