MOODY'S INVESTORS SERVICE

RATING METHODOLOGY

US Stand-alone Housing Bond Programs Secured by Credit-Enhanced Mortgages Methodology

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This rating methodology replaces the *US Stand-Alone Housing Bond Programs Secured by Credit Enhanced Mortgages* methodology published in October 2017. The primary revisions include the incorporation of potential loss to a transaction given the default of the investment provider into our approach for assessing the risk of long-term investment agreements. We have also raised the cap on ratings for transactions secured by mortgages insured by the US Federal Housing Administration's standard risk mortgage insurance program to one notch below the rating for the US government.

Introduction

In this rating methodology, we explain our general approach to assessing credit risk for US stand-alone housing bonds secured by credit-enhanced mortgages, including the qualitative and quantitative factors that are likely to affect rating outcomes in this sector.

We also discuss other rating considerations, which are factors whose credit importance varies widely among issuers in the sector or which may be important only under certain circumstance or for a subset of issuers. In addition, some of the methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector.[1] Furthermore, since ratings are forward-looking, we often incorporate directional views of risks and mitigants in a qualitative way.

Our presentation of this rating methodology proceeds with (i) the scope of this methodology; (ii) the methodology framework; (iii) a description of a typical transaction structure; (iv) a discussion of the rating factors; (v) other rating considerations; (vi) the assignment of instrument-level ratings; (vii) methodology assumptions; and (viii) limitations.

In Appendix A, we describe the Ginnie Mae construction loan certificate/project loan certificate (CLC/PLC) structure. In Appendix B, we provide additional detail regarding our analysis of cash flows. Appendix C explains how we assign a rating cap, if any, on the transaction based on the investment provider's rating. In Appendix D, we describe our assessment of bankruptcy mitigation.

[1] A link to an index of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

Scope of This Methodology

This methodology applies to stand-alone housing bonds secured by a single mortgage or a pool of mortgages guaranteed or insured by the US federal government or by a state or local government in the US. The transactions are stand-alone because repayment of the bonds depends on a defined pool of collateral and collateral enhancement; no entity provides a full faith undertaking to repay the bonds.

These bonds are issued by US local governments, states or housing finance agencies (HFAs). Stand-alone housing bonds are a source of financing for loans to single-family homeowners and loans to developers of multi-family housing projects, hospitals, nursing homes, healthcare facilities or other housing-related projects. Bonds rated under this methodology are supported by mortgages that are enhanced by programs that include the following:

- Government National Mortgage Association (Ginnie Mae), Federal National Mortgage Association (Fannie Mae) or Federal Home Loan Mortgage Corporation (Freddie Mac) mortgage-backed securities (MBS)
- Fannie Mae or Freddie Mac standby credit enhancement instruments (CEI)
- Federal Housing Administration (FHA) risk-sharing mortgage insurance
- FHA standard mortgage insurance
- State of New York Mortgage Agency project pool insurance (SONYMA insurance)

The guarantee or insurance, known as a credit enhancement, is a pledge by an enhancement provider to make full and timely payments of mortgage principal and interest to a bond trustee regardless of the actual performance of the underlying mortgage, or to pay an insurance claim on a defaulted mortgage.

Stand-alone housing bonds are typically financed under a single stand-alone indenture or other financing agreement. They do not benefit from active management or oversight by a housing finance agency (HFA) and generally do not use a master indenture governing multiple bond issuances. Transactions that exhibit these features are rated under other methodologies. Where housing bond structures include credit enhancement on the payment of bond interest and principal itself, rather than enhancement on the underlying mortgages, we apply our credit substitution methodology.[2]

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moodys.com for the most updated credit rating action information and rating history.

Some stand-alone housing bonds are for projects that are under construction or that will be constructed. For these projects to be rated under this methodology, the credit enhancement needs to cover all construction advances in addition to the permanent loan once construction is completed. For example, Ginnie Mae has a multi-family MBS structure under which bond proceeds are drawn upon first to fund project construction and then to fund the permanent long-term loan in what is typically referred to as a construction loan certificate/project loan certificate (CLC/PLC) structure. Depending on the terms, these transactions may be rated under this methodology. For a discussion of the additional credit considerations related to the CLC/PLC structure, please see Appendix A.

[2] A link to an index of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

Methodology Framework

This rating methodology is composed of four factors. Some of the four factors comprise a number of sub-factors.

EXHIBIT 1

US Stand-alone Housing Bonds Secured by Credit-Enhanced Mortgages: Factors and Sub-factors

Factor	Sub-factor
Mortgage Enhancement	Enhancement Provider's Financial Strength
	Mortgage Enhancement's Terms
Structural Framework of the Transaction	Security Pledge and Collateral
	Administrative Complexity
	Flow of Funds
	Mortgage Prepayments and Bond Redemptions
	Reserves
	Other Legal Provisions
Cash Flow and Projection Performance	--*
Investments	--*

**This factor has no sub-factors.*

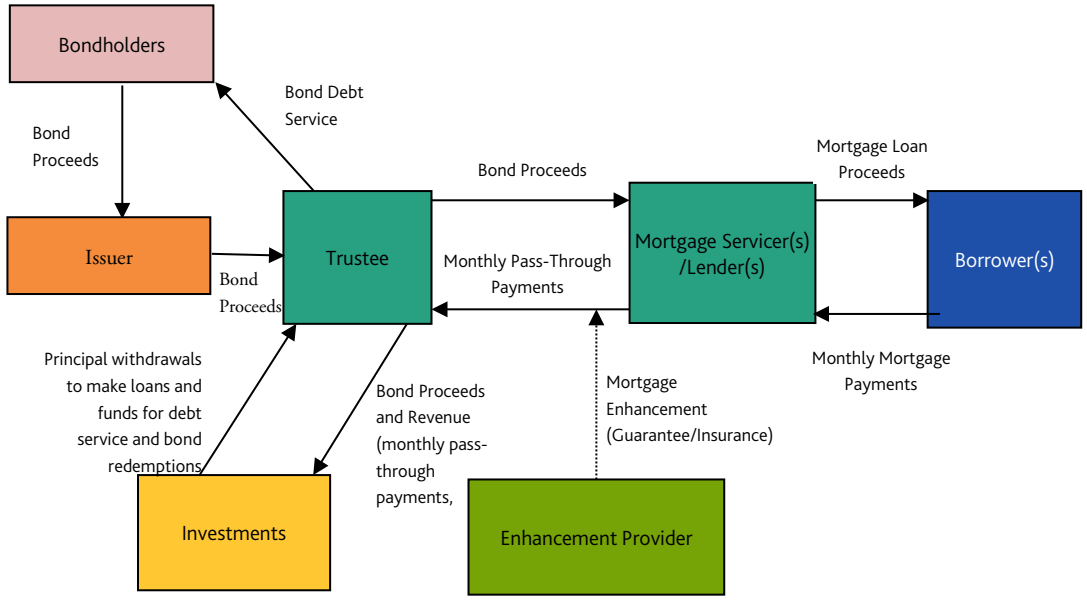
Typical Transaction Structure

In a typical stand-alone housing bond transaction, the borrower makes monthly mortgage payments to a mortgage servicer, which then forwards the monthly payments after any fees (i.e., the pass-through payments) to the bond trustee. The bond trustee collects and invests these payments in accordance with the governing bond documents. The pass-through payments, along with any investment earnings, are used to pay bond interest and principal.

If the borrower fails to fulfill its monthly obligations, the guarantee or insurance provided by the enhancement provider covers the mortgage principal and interest. Exhibit 2 illustrates the structures of single-family and multi-family bonds secured by credit-enhanced mortgages.

EXHIBIT 2

Stand-alone Housing Bonds Secured by Credit-Enhanced Mortgages



Source: Moody's Investors Service

Discussion of the Rating Factors

In this section, we explain our general approach to each rating factor, and we describe why each is meaningful as a credit indicator.

Factor: Mortgage Enhancement

Why It Matters

Mortgage enhancement is important because it transfers the bondholders' exposure to the underlying borrower to an enhancement provider of typically higher credit quality.

This factor has two sub-factors:

- Enhancement Provider's Financial Strength
- Terms of the Mortgage Enhancement

Mortgage enhancement is the enhancement provider's pledge to make full payments of mortgage principal and interest to the bond trustee, regardless of the actual performance of the underlying mortgage. It can also be a pledge to pay an insurance claim on a defaulted mortgage; the calculation of the payment is predetermined and, together with other reserves, the payment is sized to pay off bonds outstanding.

The terms of the mortgage enhancement are important because one of the defining characteristics of transactions rated under this methodology is that they are secured by credit-enhanced mortgages, and the terms of the enhancement determine whether it is effective in transferring credit risk to the enhancer. In addition, these transactions typically do not benefit from any subordinated tranches, and they have limited if any excess cash flow and limited reserves. Thus, the certainty and timing of payments received by the issuer relative to the time that debt service payments are due is very important.

How We Assess It

ENHANCEMENT PROVIDER'S FINANCIAL STRENGTH:

The enhancement provider's financial strength is based on its credit profile, as indicated by its credit rating. The enhancement provider's credit rating is the highest eligible rating for a stand-alone housing transaction. As a result, changes in the enhancement provider's rating generally result in a similar change to the rating for the stand-alone housing bond transaction, unless the transaction's rating is constrained by other factors. For example, a change in the rating for the US government would typically result in a rating change for all equivalently rated bonds secured by mortgages enhanced by one of the US-related enhancement organizations.

In assessing this sub-factor, we consider the following:

- The enhancement provider and the funding source for the enhancement (e.g., the US Treasury is the funding source for FHA mortgage enhancements).
- The position of the enhancement (i.e., whether the provider's credit-enhancement obligation is senior, junior, secured or unsecured).

MORTGAGE ENHANCEMENT'S TERMS:

In assessing this sub-factor, we consider whether the terms of the mortgage enhancement protect bondholders in the event of a missed or late mortgage payment.

For bonds rated under this methodology, the following terms or terms that provide similar protections must be included:

- The bond principal is fully covered by the amount of mortgage principal that is enhanced and the amount of cash investments in the transaction, and bond interest can be covered by the interest on the mortgages, MBS and cash investments.
- Any offsets to the payments from the enhancer are well defined and can be covered by cash in the transaction.
- The enhancement covers received payments that have been subsequently disgorged as a preference or due to the automatic stay resulting from the borrower's bankruptcy.

We also consider whether there is a defined time frame in which a missed or late mortgage payment will be paid by the enhancement provider. In cases where there is no defined timing on claims payments, we typically consider the nature of the enhancer (e.g., the policy and purpose of a governmental enhancement provider) and assess the enhancement provider's track record of payments, which may lead to a rating on the transaction that is lower than the credit enhancer's rating. We generally assess reserve levels relative to the potential cash needs caused by a timing delay for all transactions, and for transactions without a defined

payment time frame, this assessment typically incorporates our view of how the uncertainty in timing could affect the need for reserves to meet debt service.

Exhibit 3 provides examples of typical mortgage enhancements that secure bonds in this sector.

EXHIBIT 3

Examples of Mortgage Enhancements

Enhancement Provider	Description of Provider	Mortgage Enhancement	Highest Eligible Rating for Bonds	Primary Rating Rationale with Respect to Mortgage Enhancement's Credit Quality
Ginnie Mae	Wholly owned US government corporation	Mortgage-backed securities	US government's rating	Backed by the full faith and credit of the US government. The timing of these payments is defined.
Fannie Mae and Freddie Mac	Government-Sponsored Enterprise (GSE)	Mortgage-backed securities or credit-enhanced instruments	Respective ratings of these GSEs	The timing of these payments is defined.
FHA	Government agency within the US Department of Housing and Urban Development (HUD)	Risk-sharing mortgage insurance (see further information below)	US government's rating	FHA's obligation to pay the insurance claim in one full payment and its history of claims payments, as well as the high level of administrative sophistication of HFAs, serves to mitigate the undefined timing of payment.
		Standard risk mortgage insurance	One notch below US government's rating	Backed by the full faith and credit of the US government but rated lower due to undefined timing of payment and a two-step payment process that adds further timing uncertainty.
SONYMA Mortgage Insurance Fund (MIF)	Insurance fund	Pool insurance	SONYMA MIF's rating	Insurance claims paid by SONYMA MIF. The timing of these payments is defined.

FHA Standard Risk Mortgage Insurance and Risk-Sharing Mortgage Insurance

The rating of bonds secured by FHA standard risk mortgages is capped at one notch below the US government's rating. This cap incorporates the risks of the FHA's two-step claims payment procedure for standard risk mortgages and the uncertainty associated with the timing of the claims payment, which can be mitigated to an extent by reserves established to provide a debt service cushion.

Bonds secured by FHA risk-sharing mortgages may be assigned a rating that is equivalent to the rating for the US government, based on a one-step claims process and a program history of relatively expedient claims payments; furthermore, issuers are typically state or local HFAs with sophisticated management and experience in administering the claims filing process.

Factor: Structural Framework of the Transaction

Why It Matters

The structural framework of a stand-alone housing transaction is important because transaction documents define, among other aspects, the assets and revenue available to pay debt service, how the servicer will administer the mortgages, how the funds will flow into the trustee account and how the trustee will use the available funds to pay the bonds and meet other obligations. Some aspects of the structural framework affect our view of whether the bonds are fully secured by credit enhanced mortgages and whether they can be rated under this methodology, and other aspects relate whether we have sufficient information to rate the transaction. Structural weaknesses can add risks that may not be addressed by the rating factors in this methodology, and these weaknesses may introduce risk scenarios that are difficult to predict. For example,

insufficient clarity in the priority of payments or the amount of ongoing fees may introduce uncertainties that could have a significant impact on default risk.

The factor has five sub-factors:

Security Pledge and Collateral

Because these are stand-alone bonds with no source of repayment beyond the defined collateral pool (including pledged funds and investments) and the collateral enhancement, it is important that the security pledge and collateral established in the bond indenture and related transaction documents encompass all of the pledged assets and revenue available to pay debt service and create a perfected lien. For MBS bonds, we also typically consider whether the types of securities that may be purchased are covered under the enhancement programs.

Administrative Complexity

The credit quality of stand-alone housing bonds greatly depends on whether the administration of the transaction is in accordance with the details put forth in the bond documents, particularly in the trust indenture. Many stand-alone housing transactions are structured such that timely payment to bondholders depends on effective and timely administration, because there are limited reserves and little or no overcollateralization. Administration includes collection and transfer of payments, drawing on the enhancement, investing the funds, payment of fees and scheduled debt service and redemption of bonds. The financial positions of certain US stand-alone housing bonds have deteriorated because a participant, such as the trustee or loan servicer, failed to carry out one or more of its administrative duties, e.g., a failure to redeem bonds on a timely basis or an improper investment of funds.

Flow of Funds

Provisions related to the flow of funds are important because they prioritize where bond principal and interest fall in relation to other uses of pledged revenue.

Mortgage Prepayments and Bond Redemptions

Mortgage prepayments are important because they can create cash flow volatility that may expose the transaction to credit risk. Bond redemptions are an important consideration because a deviation from the projected mortgage loan repayment or debt service schedule may result in current or future cash flow insufficiency, for example due to a negative spread between interest earned on assets and interest paid on liabilities.

Reserves

Reserves are critical because they provide additional protection to bondholders if cash flow is delayed or disrupted, for example while mortgage insurance claims are being processed.

Other Provisions

Other provisions, such as the conditions under which the trustee can accelerate bonds upon a covenant breach, are important because they may provide additional protection to bondholders.

How We Assess It

We consider whether the parameters of the transaction and the trustee's obligations are set out clearly and consistently in the bond documents. We also consider whether the bond documents provide a transaction structure that conforms with the enhancement type and the transaction's future cash flows.

SECURITY PLEDGE AND COLLATERAL:

In assessing this sub-factor, we generally consider whether the transaction documents contain clear provisions related to priority, trustee directions, delivery of bonds and certain other matters. For bonds rated under this methodology, the transaction structure must include the following provisions or provisions that provide similar protections:

- The bonds have a first lien on the pledged assets.
- The directions to the trustee or loan servicer regarding the use of the credit enhancement is consistent with the terms of the enhancement agreement.
- The receipt of bond proceeds and other funds, and the execution of the investment agreement(s) occur prior to, or simultaneously with, the trustee's delivery of the bonds.
- The transaction documents provide standard protections for bankruptcy-related risks regarding any contributions by or on behalf of the issuer or, in the case of multi-family transactions, the borrower,[3] i.e., representations and warranties and well-reasoned and clearly stated opinions of counsel providing reasonable assurance that contributions are unlikely to be classified under the US Bankruptcy Code as a preferential transfer and would not be subject to disgorgement or automatic stay provisions. Please see Appendix D for a more detailed discussion on our assessment of bankruptcy mitigation.

ADMINISTRATIVE COMPLEXITY:

We assess the administrative complexity of the overall transaction, the likelihood of administrative errors and any mitigants to this risk. Administrative complexity may limit the highest eligible rating for a US stand-alone housing bond.

We believe that a Aaa rating is appropriate only where the other aspects of the transaction support this rating level and where the transaction structure is simple or the complexity is mitigated.

- We assess the overall transaction complexity and likelihood for errors. Some relatively simple structures that can qualify for a Aaa rating include single-family and multi-family monthly pass-through structures.
- Oversight from an actively managed HFA, which is generally found in FHA risk-sharing programs, is typically a sufficient mitigant.
- Significant over-collateralization can offset the potential for lower revenue arising from administrative error. We consider that a transaction with a minimum asset-to-debt ratio of 103% that will be maintained throughout the life of the bond is sufficiently mitigated.

Certain cash flow assumptions and projections may mitigate the transaction's exposure to administrative errors, depending on the overall financial position and cash flow strength of the transaction. These may include:

- An assumption of 0% investment earnings, even if there are long-term investment agreements with financial institutions. Over time, this could result in some excess funds available to cover shortfalls due to an administrative error.
- Cash flow projections that demonstrate positive net revenue during every interest payment period. Please see a detailed discussion of our cash flow projection analysis below and in Appendix B.

Transactions that are complex and do not have these mitigants typically do not qualify for a Aaa rating and would likely be capped at Aa1. Certain legal provisions in the bond indenture tend to increase exposure to administrative errors. These provisions include:

[3] Borrowers make mortgage payments and may also make other payments, for example borrowers may also contribute funds to cover negative arbitrage, timing lags or other shortfalls.

» Surplus revenue may be remitted to the borrower, unless those payments are clearly limited to investment earnings that were not included in the original cash flow projections for the transaction.

» Bond denominations other than $1, unless the financial position of the transaction is strong enough to mitigate the cost related to a lag in the redemption of bonds.

FLOW OF FUNDS:

For bonds rated under this methodology, the transaction structure must include the following provisions or provisions that provide similar protections:

» The priority of payment of bond interest and principal in the cash flow waterfall and upon default is clearly defined in the transaction documents.

» Transparent disclosure of the fee structure that:

  » Clearly establishes the fees and expenses to be paid from the trust accounts, the sources of payments and how the fees are calculated. The fee structure needs to be defined in such a way that we can assess whether the cash flow on the deal will be sufficient to pay the fees throughout the life of the transaction.

  » The documents clearly state whether an event of default or an acceleration of principal due to a missed or late payment of any fee is permitted.

» Investment criteria under which all revenue is invested in permitted or specific investments promptly or within a defined period following receipt of applicable funds.

We also consider the following provisions related to cash flows and bond redemptions and adjust the cash flow scenarios accordingly:

» We review the transaction documents to see how principal and interest received in excess of regularly scheduled pass-through payments is used, for example whether they are used to redeem bonds. We assess cash flow scenarios based on this provision.

» We review the transaction documents to see how and when any unexpended bond proceeds are used to redeem bonds after the initial, defined acquisition or construction period. We assess cash flow scenarios based on this provision.

MORTGAGE PREPAYMENTS AND BOND REDEMPTIONS:

For bonds rated under this methodology, the transaction structure must include the following provisions or provisions that provide similar protections:

» The requirements and circumstances for redeeming bonds from mortgage prepayments are defined.

» In the event of a multi-family partial mortgage prepayment, the trustee receives and discloses revised cash flow projections that reflect the modified loan amortization and updated sinking fund in a timely manner.

» The redemption dates and premiums associated with underlying mortgage prepayments are synchronized with those of the bonds and the MBS such that there will not be shortfalls in cash flows.

» Bond redemptions are only subject to providing prior notice to bondholders with a defined maximum notice period.

RESERVES:

We assess the sufficiency of reserves relative to the likely needs for using the reserves, based on our assessment of potential timing delays or other cash flow shortfalls arising from the transaction structure. Two common reserves are the capitalized interest reserve, which provides revenue for debt service before loan revenue flows into the transaction's revenue fund, and the debt service reserve fund (DSRF), which provides revenue for debt service when there is a lag in payment from the enhancement provider. DSRF funding levels are generally sized as a number of months of maximum annual debt service (MADS). Exhibit 4 highlights the typical DSRF funding levels by enhancement type.

In cases where the DSRF is funded at somewhat lower levels, we typically notch the rating down from the highest eligible level by one to three notches; however, for enhancement providers and enhancement types that typically have a delay, the absence of a sufficiently funded reserve may lead to an expectation of default with the rating dependent on the expectation of recovery. Generally, if a DSRF is funded below the typical funding levels (as outlined in Exhibit 4), we notch the rating down from the highest eligible level by at least one notch. If a DSRF is funded at a level that is less than three-quarters of the typical funding levels, we typically notch the rating down from the highest eligible level by at least two notches, and if it is funded at a level that is less than one-half of the typical funding levels, we typically notch the rating down from the highest eligible level by at least three notches.

EXHIBIT 4

Typical Debt Service Reserve Funding by Enhancement Type[4]

Enhancement Provider	Enhancement Type	Typical DSRF Funding
FHA	Cash Payment	8 months of MADS plus 1 month mortgage interest[5]
FHA	Debenture	12 months of MADS plus 1 month mortgage interest
FHA	Risk-Sharing	6 months of MADS plus 1 month mortgage interest
SONYMA MIF	Pool Project Insurance	2-4 months of MADS

OTHER PROVISIONS:

Other transaction provisions that do not fall into the categories above may provide bondholders with additional credit protection. For bonds rated under this methodology, the transaction structure must include the following provisions or provisions that provide similar protections:

- The trustee accelerates bonds upon a covenant breach or other non-payment default only when there is 100% bondholder approval, unless there are sufficient funds to make bondholders whole and pay associated fees on the acceleration payment date.
- Trustee resignation or removal does not take effect until a successor is in place, ensuring continuous management of the transaction.

In cases where the issuance of additional bonds is permitted within an existing transaction, the terms of the additional bonds, mortgages and enhancement are provided, and the issuer provides revised cash flow projections that reflect the additional bonds.

[4] DSRFs are unnecessary in structures where receipt of the mortgage payments is guaranteed before the debt service payment date.

[5] For FHA cash payment enhancement, the FHA takes a 1% assignment fee when the FHA pays the claim. Unless the cash flows value the loan at 99%, the DSRF would typically be funded by an additional amount equal to 1% of the mortgage(s) to cover the assignment fee.

Factor: Cash Flow Projection Analysis

Why It Matters

Cash flow projections are an important indicator of a transaction's ability to meet its debt service obligations.

How We Assess It

In assessing potential cash flow performance, we consider the inputs to the cash flow projections. We also consider various scenarios.

» **Inputs:** We use inputs as described in the bond documents, including the terms of the enhancement programs and other elements such as the size, terms and rates of mortgage loans and MBS, expenses, initial balances in trust accounts, and investments.

» **Scenarios**: Cash flow scenarios are primarily based on mortgage originations and mortgage prepayments. Please see Appendix B for more information about the scenarios we review.

Assessment of Projected Cash Flows That Demonstrate Sufficiency

We analyze the results of the cash flow projection scenarios to assess the sufficiency of cash flow relative to debt service and other cash needs. In order for a transaction to demonstrate sufficiency, the following conditions must be met:

» There is in all periods sufficient cash flow from mortgage and investment revenue as well as available cash and reserves to cover debt service obligations and any applicable expenses.

» The asset-to-debt ratio is greater than or equal to 100% in all periods. The ratio's numerator is total pledged assets, including the par values of the amortized enhanced mortgages[6] and investments. The denominator is the principal amount of bonds outstanding, accrued but unpaid interest, and potentially payable interest based on the maximum number of days needed under the notice of redemption period as stated in the indenture.

Transactions that demonstrate sufficiency are eligible to be rated based on the other methodology rating factors, i.e., the projection cash flow analysis factor does not constrain the rating.

Assessment of Projected Cash Flows That Do Not Demonstrate Sufficiency

Transactions that do not demonstrate sufficiency of cash flow at closing are rated substantially lower than the rating of the credit enhancement provider.

Once a transaction has been issued and closed, unexpected events, such as delays in redemption due to imperfect execution of instructions, can cause projected remaining cash flows not to demonstrate sufficiency. In these cases, ratings may be assigned a lower rating than the highest eligible bond rating due to a potential for a missed bond payment in the future caused by the insufficiency. Our assessment in these cases is based the amount of the insufficiency (generally, these are expected to be small amounts) and on the likelihood that improved investment returns and mortgage prepayments will result in cash flow performance that returns the transaction to sufficiency.

When a transaction's assets are invested in short-term securities, our base case cash flow projections use an input of a 0% investment earnings rate to account for the uncertainty of future returns. However, in most

[6] For FHA programs, the enhanced mortgage value used for this calculation is 99% of par to reflect the FHA's 1% assignment fee.

periods, investment earnings are positive, even if they are very small. Our evaluation of the likelihood that the shortfall will be eliminated prior to projected default incorporates the time until projected default and our calculation of the return on investments necessary to achieve sufficiency (referred to as the break-even investment rate). We compare that rate to current yields on short-term investments and the forward yield curve.

Generally, the longer the period of time a transaction has before a projected cash flow insufficiency using a 0% investment earnings input, the higher the likelihood of improved performance of the transaction. Exhibit 5 provides very general guidance on how we may incorporate the timing until the first projected insufficiency into the broad rating category when monitoring the performance of a transaction. This general guidance takes into account the potential for other corrective actions over time, such as the receipt of payments from other sources. The table is a general guideline, and a starting point for our analysis in these cases, which typically also incorporates the probability of a scenario or scenarios with insufficient cash flows.

For transactions with prepayments, to determine the duration until the insufficiency, we typically use the weakest of the scenario results from the prepayment scenarios outlined in Appendix B.

In cases of transactions with limited potential for improved performance, such that there is a high likelihood of default for any reason and over any time frame, guidance in Exhibit 5 would not be applicable. In these cases, ratings would reflect our expectations for the likely range of bondholder recovery in the event of default. Please see the Moody's publication *Rating Symbols and Definitions*,[7] which provides rough guidance for ranges of approximate expected recoveries associated with ratings for defaulted or impaired securities. This publication also describes other considerations when a debt instrument becomes impaired or defaults, or is very likely to become impaired or to default.

EXHIBIT 5

General Impact of Projected Insufficiency on Highest Eligible Broad Rating Category, Where Return to Sufficiency is Likely

Timing Until First Projected Insufficiency Date	Broad Alpha Rating Category of the Bond Unlikely to Exceed:
Greater than 18 years	No constraint based on this consideration
Greater than 13 but less than or equal to 18 years	Aa
Greater than 8 but less than or equal to 13 years	A
Greater than 6 but less than or equal to 8 years	Baa
6 years or less	Ba

Factor: Investments

Why It Matters

Investments are important because both the principal invested and the investment earnings may be required to meet debt service obligations or expenses.

Most stand-alone housing bond issuers are not directly involved in investment decisions and typically rely on investment providers. If the investment provider is unable to perform in accordance with the contract's terms or enters bankruptcy, there may be shortfalls in debt service payments that result in losses to bondholders due to a loss of interest earnings or principal of the invested funds. In addition, the bond

[7] A link can be found in the "Moody's Related Publications" section.

trustee is expected to fulfill the investment responsibilities stated in the trust indenture, including making short-term investments that ensure funds are readily available to pay debt service.

Long-term Investment Agreements

The most commonly used long-term investment agreements in this sector are guaranteed investment contracts (GICs), fixed-rate investment agreements or repurchase agreements (repos) with a guaranteed investment rate.[8] These investments provide a predetermined, guaranteed long-term fixed rate of return on funds invested with financial institutions, such as banks or insurance companies. For GICs provided by insurance companies, we use the Insurance Financial Strength Rating. When the GIC provider is a bank, we use the bank's deposit rating. For repurchase agreements, we use the provider's Counterparty Risk Rating.[9]

There are two types of GIC funds:

- **Acquisition Fund GICs.** During the initial project construction or mortgage acquisition/origination phase, the stand-alone housing bond transaction may hold most or all of the bond proceeds in an acquisition fund GIC. Bondholders are exposed to the risk of losing the entire amount of bond proceeds if the GIC provider unexpectedly defaults on its obligations.

- **Float and Reserve Fund GICs.** Float funds are funds that are received prior to making periodic debt service payments, and float fund GICs generally hold no more than six months of pass-through mortgage payments or prepayments. Some transactions include reserve funds as part of the structural features, and reserve fund GICs typically hold funds that may be used to pay debt service when there are delays in receiving other cash flows. Some transactions are structured such that funds accumulated over time in the reserve are part of the cash needed to make future bond payments. Because the maximum balance of the funds in float and reserve fund GICs is typically much smaller than the maximum balance of acquisition funds, these reserves generally expose bondholders to smaller potential loss relative to acquisition fund GICs if the investment provider declares bankruptcy.

Short-term Securities

These investments, which include US Treasury notes and money market funds, typically have rates that vary over time, and there is no guarantee of achieving a particular rate of return. In cases where the transaction structure depends on earnings from these investments to cover debt service or expenses, short-term securities can expose the bonds to investment risk over the life of the issue.

How We Assess It — Long-term Investment Agreements

Acquisition Fund GICs

Given the risk of loss of a significant portion of funds during the initial period, we cap the highest possible bond rating at the acquisition fund GIC provider's rating during the mortgage acquisition/origination period.

[8] In this methodology, we use the terms GICs, fixed-rate investment agreements and repurchase agreements interchangeably, and we refer to all of these counterparties as GIC providers. This methodology primarily focuses on GICs, because the issues relating to them are more universal. We generally treat repurchase agreements the same as GICs.

[9] *Rating Symbols and Definitions* includes definitions of Insurance Financial Risk Rating and Counterparty Risk Rating. Please see the "Moody's Related Publications" section for a link to that publication.

In some cases, the obligations of the GIC provider are backed by a letter of credit (LOC) issued by an independent financial institution. In these cases, we use the higher of the GIC provider's rating and the LOC provider's issuer rating or Counterparty Risk Assessment.

Float and Reserve Fund GICs

For all stand-alone housing transactions that use float or reserve fund GICs, the transaction cannot be rated higher than five alphanumeric notches above the rating of the GIC provider. We perform a scenario analysis to assess the impact on the issuer's cash flow and the potential losses to bondholders in the event that the GIC provider defaults on its obligations. This assessment may result in a rating cap that is fewer than five notches above the GIC provider's rating. For information, please see Appendix C.

Enforceability Against Providers Under Applicable Laws

In assessing long-term investment agreements, we also typically consider whether a GIC is enforceable against the provider under applicable state, federal or foreign laws. We generally review the domestic or foreign enforceability opinion to see that it clearly states the GIC is a legal, valid and binding obligation. If the obligations of the provider are guaranteed by another entity under the agreement, we typically consider the opinion addressing the enforceability of the guarantee. If the opinion does not clearly state the GIC agreement or guarantee is enforceable, or if any events occur that bring enforceability into question, we typically exclude all or some portion of GIC income or principal from our cash flow analysis.

How We Assess It — Short-term Securities

For transactions invested in short-term securities, we review the investment parameters, including the types, credit quality and tenor of permitted investments, and we typically consider the following:

- Whether the transaction documents clearly define permitted investments, including credit rating levels for the securities other than securities issued by or closely related to the US government. The absence of clear guidelines may lead to material risks, the effect of which we cannot predict, and the transaction may not qualify to be rated under the approach described in this methodology.
- Whether the credit risk of the permitted securities is within one broad alpha rating category of the highest eligible rating of the bonds based on the other methodology factors, or the investments have a Prime-1 (P-1) short-term rating. If investments of materially lower credit quality are permitted, the rating of the bonds may be constrained, and we would typically use the rating of the permitted investment with the lowest credit quality and the approach described in Appendix C to assess the impact of these investments on the rating.
- Whether the transaction documents direct the bond trustee to purchase investments with a maturity that is shorter than or equal to the date when the invested funds are needed under the indenture, e.g., the next debt service payment date or the next potential bond redemption date. If there is a mismatch, the rating of the bonds may be constrained below the highest eligible rating based on the other methodology factors. Considerations would include the extent of the potential mismatch as well as our view of the market liquidity for the permitted securities and their volatility.

Commonly Eligible Short-Term Securities

US Government Obligations – Obligations or securities whose timely payment of principal and interest are guaranteed by the US government.

Direct US Treasury Obligations – Securities issued by the US Treasury Department and guaranteed by the US government, such as Treasury bills.

US Federal Agency Securities – Debt instruments issued by federal departments and federally related agencies that are fully backed by the full faith and credit of the US government. This group of issuers includes:

- Ginnie Mae
- FHA
- US Maritime Administration, which operates within the US Transportation Department
- Small Business Administration
- General Services Administration

Government-sponsored Enterprises (GSEs) – While the debt of GSEs is not backed by the full faith and credit of the US government, each agency has a loan entitlement or line of credit with the US Treasury. This group includes:

- Fannie Mae and Freddie Mac
- Federal Home Loan Bank (FHLB)
- Resolution Funding Corporation (REFCORP)
- Federal Farm Bank Credits
- Tennessee Valley Authority

Money Market Funds – Money market funds with the highest eligible rating.

US Treasury STRIPS (Separate Trading of Registered Interest and Principal of Securities) – STRIPS are non-callable, non-prepayable zero-coupon instruments derived from selected Treasury bonds and notes with maturities of 10 years or more. STRIPS are created on request. The underlying bonds and notes are separated on the books of the US Federal Reserve by the US Treasury into their component parts of principal and interest payments.

Bank Deposits – Funds are deposited with banks (not holding companies or other related entities) with a short-term rating of P-1 or a long-term deposit or debt rating that corresponds to a P-1 short-term rating.[10]

[10] FDIC insurance alone does not guarantee timeliness of payment, and therefore we consider the short-term bank rating.

Other Rating Considerations

Ratings may include additional factors. Such factors include financial controls and the quality of financial reporting; the quality and experience of management; assessments of governance, environmental and social considerations; and possible government interference from other levels of government. Regulatory, litigation, liquidity and technology risk as well as changes in demographic and macroeconomic trends also affect ratings. We may also incorporate non-public information.

Following are some examples of additional considerations that may be reflected in our ratings.

Financial Controls

We rely on the accuracy of financial information provided by third-party trustees in assigning and monitoring ratings in this sector. The quality of financial information may be influenced by internal controls, including consistency in reporting policies and procedures.

Liquidity

Liquidity is an important rating consideration for all transactions in this sector. In the Mortgage Enhancement and Structural Framework of the Transaction sections, we discuss some structural features, including reserves, that can affect liquidity. More generally, liquidity issues can arise when there are meaningful mismatches in the timing of cash receipts and cash outlays. We form an opinion on the propensity of the transaction to introduce liquidity shortfalls as well as likely near-term liquidity requirements from the perspective of both sources and uses of cash. Ratings can be heavily affected by extremely weak liquidity.

Event Risk

We also recognize the possibility that an unexpected event could cause a sudden and sharp decline in an the fundamental creditworthiness of a transaction. Event risks — which are varied and can include natural disasters, legal judgments, cybercrime and abrupt changes in state or federal policy — can overwhelm even a stable stand-alone housing transaction. Event risk analysis for this sector typically includes an assessment of the nature of the disruption and lost revenue.

Regulatory and Policy Considerations

Issuers of US stand-alone housing bonds secured by credit enhanced mortgages are subject to varying degrees of regulatory oversight, as are their counterparties. In some circumstances, regulatory considerations may be a rating factor, for instance when regulatory change is swift. Changing political considerations may also affect ratings. For instance, if the policy of a credit-enhancer changed in a manner that affected its willingness to provide support or the timing of payments that are not contractually prescribed, ratings in this sector could be affected.

Environmental, Social and Governance (ESG) Issues

ESG considerations may affect the ratings of counterparties to a credit-enhanced standalone housing transaction as well as underlying asset values. We also consider how the issuer's governance affects creditors. Please see our cross-sector rating methodology that discusses general principles for assessing environmental, social and governance risks.[11]

[11] A link to an index of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

Assigning Instrument-Level Ratings

After considering the rating factors, other rating considerations and relevant cross-sector methodologies, we assign may one or more instrument-level ratings. Individual debt instrument ratings may be notched down from the senior instrument-level rating.

Assumptions

Key rating assumptions that apply in this sector include our view that sovereign credit risk is strongly correlated with that of other domestic issuers, that legal priority of claim affects average recovery on different classes of debt sufficiently to generally warrant differences in ratings for different debt classes of the same issuer, and the assumption that access to liquidity is a strong driver of credit risk.

Our forward-looking opinions are based on assumptions that may prove, in hindsight, to have been incorrect. Reasons for this could include unanticipated changes in any of the following: the macroeconomic environment, general financial market conditions, industry competition, disruptive technology, or regulatory and legal actions.

Limitations

In the preceding sections, we have discussed the factors, many of the other rating considerations that may be important in assigning ratings, and certain key assumptions. In this section, we discuss limitations that pertain to the overall rating methodology.

General Limitations of the Methodology

This methodology document does not include an exhaustive description of all factors that we may consider in assigning ratings in this sector. Transactions in the sector may face new risks or new combinations of risks, and new strategies or structural features may be developed to mitigate risk. We seek to incorporate all material credit considerations in ratings and to take the most forward-looking perspective that visibility into these risks and mitigants permits.

Ratings reflect our expectations for the future performance of an issuer or transaction; however, as the forward horizon lengthens, uncertainty increases and the utility of precise estimates, as factor inputs or in other rating considerations, typically diminishes. In any case, predicting the future is subject to substantial uncertainty.

Appendix A: The Ginnie Mae CLC/PLC Structure

In this appendix, we describe the construction loan certificate/project loan certificate (CLC/PLC) structure and the structural features that must be present in order for us to consider the Ginnie Mae guaranty effective as an additional credit enhancement for transactions secured by CLCs and PLCs to be eligible for a rating under this methodology.

The Ginnie Mae CLC/PLC program guarantees mortgage payments both during project construction and after the housing project is placed into service. Where Ginnie Mae's transaction requirements are met, CLCs and PLCs carry Ginnie Mae's guaranty of timely payment.

The borrower (i.e., the developer of the housing project) makes monthly mortgage payments, which are the underlying source of funds for the two types of mortgage-backed securities issued by the lender: CLCs and PLCs. With respect to each construction advance to the lender, the lender issues a CLC in a like amount bearing interest at the pass-through mortgage rate. The trustee purchases these mortgage-backed securities with Ginnie Mae's guaranty. After project completion and final endorsement for FHA insurance, the trustee exchanges outstanding CLCs for a PLC secured by the permanent mortgage loan.

In assessing whether a transaction is eligible for a rating at the US government's level, our primary considerations include: (i) whether the Ginnie Mae guaranty is sufficient to pay bond principal and interest on all advances made by the trustee; (ii) whether the legal structure provides for a transition into the permanent loan period without gaps in timing or coverage; and (iii) whether the parameters provide for full bond redemption if the project does not receive FHA endorsement or is not completed.

The following are examples of Ginnie Mae's enhancement program conditions to provide the guaranty and the structural provisions that must be present in order for us to consider the guaranty effective:

- CLC maturity dates extend beyond the PLC delivery date and the developer's estimated project completion date to account for construction delays.
    - In the case of an extension of the CLC maturity date, the PLC delivery date, or the date for commencement of amortization, we may run or request cash flow projections to assess sufficiency.
- For transactions that allow interim construction advances of bond proceeds prior to CLC acquisition, Ginnie Mae requires the lender to fund the first and last construction draws as a condition to guarantee the draws.
    - In these cases, the structure must direct the trustee to withhold accrued interest until the CLC is delivered.
    - In addition, we review Ginnie Mae's written commitment to enhance the CLCs even in the event of a default by the borrower or lender.
- When the actual project completion schedule and construction costs diverge from initial projections, there may be a mismatch between the mortgage loan amount, aggregate outstanding CLCs and the PLC. Transactions must include structural features that mitigate this risk. These structural features typically include the following provisions to eliminate the mismatch:

- When the PLC principal amount is greater than the aggregate CLCs outstanding, the trustee pays the difference between the PLC and CLCs (and any accrued interest) from available funds.
- When the PLC principal amount is less than the aggregate CLCs outstanding, the trustee exchanges aggregate outstanding CLCs only upon receipt from the lender of the difference between the CLCs and PLC. Such differences, plus any unexpended acquisition funds, are used to redeem bonds to bring mortgage assets and outstanding bonds on par.

- These structures must include the following redemption provisions to ensure that bondholders are repaid under the following scenarios:
  - The initial CLC is not delivered or delivery date is not extended.
  - The PLC is not delivered or PLC delivery date is not extended.
  - Receipt of any payments exceeding regularly scheduled payments on the mortgage-backed security including prepayments, casualty insurance proceeds or mortgage insurance proceeds.

Appendix B: Cash Flow Projection Analysis

This appendix provides further information about our approach to the inputs, scenarios incorporated into our cash flow projections (see discussion of the Cash Flow Projection Analysis factor) and cases where cash flow projections are not needed when certain conditions are met. Based on the terms and conditions of an individual transaction, we may modify these inputs or consider additional cash flow scenarios to assess a transaction's strengths and risks.

Cash Flow Inputs

We use inputs as described in the bond documents, including the terms of the enhancement programs and other elements such as the size, terms and rates of mortgage loans and MBS, expenses, initial balances in trust accounts, and investments.

In this section, we discuss some additional inputs that we use in our base case scenario for certain types of transactions, primarily related to the terms of the main credit enhancement types. Not all inputs are relevant to an individual transaction. The main inputs discussed in this section are:

- Mortgage Loans and MBS
- Trust Accounts
- Investments

Mortgage Loans and MBS

If applicable, the following payment inputs are reflected in the cash flow projections:

- In the event that multiple loan rate scenarios are possible prior to the actual mortgage origination(s), the lowest interest rate(s) permitted is (are) used in our base case scenario.
- The duration between when a borrower makes a monthly payment and when the trustee receives the funds is known as the "lag." The lag in our base-case cash-flow projections reflects the credit enhancement payment provisions, as established by the enhancement provider, plus an additional five calendar days for the receipt of payment to reflect potential administrative delays (e.g., a minor delay in the receipt of payment from the credit enhancer or servicer, including the effect of weekends or holidays). For example, if the typical payment due date for a provider were the 25th of the month, the input would be the 30th of the month.
- Since Ginnie Mae, Fannie Mae and Freddie Mac payments are made in the month following MBS issuance, MBS base case cash flow projections use an additional payment lag input of one month.

  As an example, a Ginnie Mae I security is issued on September 1. If the security's first payment would be due on October 15, the five-day lag referred to above for guaranteed payment in the event of a missed mortgage payment would be reflected in the cash flows as an MBS payment date of October 20.

Trust Accounts

The opening account balances used in our base case scenario are equal to the amount of deposits the trustee receives at closing. For updated cash flows (those reviewed after bond closing), our base case scenario typically uses the reported balances immediately following the most recent bond debt service payment.

Investments

Typically, funds are invested in permitted floating-rate investments, or a guaranteed investment contract (GIC) provider agrees to pay a fixed rate of interest on invested funds. For floating-rate investments, our base case scenario uses a 0% investment rate input. For GICs, our base case scenario uses the contractual rate in accordance with the terms of the GIC agreement.

Cash Flow Projection Scenarios

Depending on transaction specifics, we generally analyze cash flow projections based on the bond transaction type under various mortgage origination and prepayment scenarios. Additional scenarios may be analyzed to reflect the particular terms and features of a bond or credit enhancement program, or upon the occurrence of certain events. Exhibit 6 lists the cash flow scenarios we typically assess, each of which is discussed below.

EXHIBIT 6
Cash Flow Projection Scenarios

Transaction Type	Scenario
Semiannual Single-family MBS	
	Full origination – no prepayment
	Full origination – three-year weighted average life
	Full prepayment
	Full non-origination
	Partial origination – No prepayment and three-year weighted average life
	Super sinker or Planned Amortization Class (PAC) bonds*
	Call-protected, premium, taxable or Capital Appreciation Bonds (CABs)*
	Varying mortgage rates (split rate)
Semiannual Multi-family	
	Full origination – no prepayment
	Full non-origination
	Multi-family default
	FHA Risk-Sharing Insurance
	FHA Standard Cash Pay Insurance
	FHA Standard Debenture Pay
	FHA Standard Debenture Lock
Event (all transaction types)	
Transaction Extensions	
	Acquisition/construction phase extensions

* *If applicable.*

Cash Flow Projection Scenarios

FULL ORIGINATION — NO PREPAYMENT:

A full origination scenario reflects the least favorable time for acquiring the mortgage(s) and typically places the greatest amount of stress on the transaction. In most transactions, bond proceeds are placed in an

acquisition fund, which is used to purchase the mortgage loans or MBS that secure the transaction within a specified period. If the investment agreement rate on the acquisition fund is lower than the pass-through mortgage rate, in the full origination scenario, loan originations occur on the last allowable day. Effectively, in this version of the scenario, there is no underlying mortgage revenue during the acquisition or construction period, and debt service is paid from investment revenue and funds in the transaction. Conversely, if the investment agreement rate on the acquisition fund is higher than the pass-through mortgage rate,[12] in the full origination scenario, all loan originations occur on the first allowable day. Effectively, in this version of the scenario, investment earnings during the acquisition period are minimized.

In addition, for this scenario, we assume no prepayments (mortgages are paid according to their initial terms).

FULL ORIGINATION — THREE-YEAR WEIGHTED AVERAGE LIFE:

The same full origination as in the prior scenario is used in this scenario.

For bonds secured by residential MBS or collateral pools composed of residential mortgages, we assess cash flow scenarios incorporating prepayment risk. Prepayments can reduce a transaction's expected net revenue stream or cause a reduction in the weighted average pass-through mortgage rate. Since the amount of any future prepayments is uncertain, we generally review a three-year weighted average loan life scenario. In this scenario, mortgage prepayments occur such that the average life of the pool of mortgage loans is three years.

FULL ORIGINATION — FULL PREPAYMENT AND SUPPLEMENTARY PREPAYMENT SCENARIOS:

We also assess the impact of an immediate and full prepayment in both of the scenarios above. In this analysis, we calculate whether, if there were a full mortgage prepayment at the time of the lowest asset-to-debt ratio, there would be sufficient assets to cover the negative arbitrage during the lag until bonds can be redeemed in full in accordance with the transaction terms.

Based on the particular terms and conditions of an individual bond transaction or based on its historical performance, we may assess supplementary prepayment scenarios we consider relevant to the bond's expected performance. For example, we may assess a two-year weighted average life scenario in a high interest-rate environment.

FULL NON-ORIGINATION:

We review a non-origination scenario for transactions where no mortgages have been funded prior to or upon bond closing. In this scenario, no mortgages are originated, and bonds are not redeemed until the last allowable day in accordance with the transaction agreements. In this scenario, investment earnings on unexpended bond proceeds, in combination with other funds in the transaction such as capitalized interest reserves, generally provide the only funds available to meet bond debt service payments and transaction expenses until the bonds are called for full redemption.

PARTIAL ORIGINATION — NO PREPAYMENT AND THREE-YEAR WEIGHTED AVERAGE LIFE:

We review a partial-origination scenario for transactions where some mortgages have been funded prior to or upon bond closing. In this scenario, no other mortgages are funded.

In addition, for transactions with varying interest rates or terms, we typically review a scenario where only the lowest-rate mortgages are originated. This version of the partial-origination scenario isolates certain

[12] There may be situations in which the investment rate and the mortgage rate are similar. In such situations, the compounding effect of interest earnings on the monthly mortgage revenue is considered to determine whether the effective investment rate or effective pass-through mortgage rate is higher and thus whether the first or last day mortgage version of the full origination scenario is used.

mortgages to assess whether they can support bond debt service independent of other mortgages with more advantageous features. We consider the no prepayment and the three-year weighted average life scenarios as described above.

SUPER SINKER OR PLANNED AMORTIZATION CLASS (PAC) BONDS:

A super sinker is used for single-family housing bonds and is a mechanism for concentrating mortgage prepayments toward a specifically identified bond maturity that is redeemed first from all mortgage prepayments. This allows the super sinker bond to be paid faster than other bonds in the offering.

In the PAC bond structure, a specifically identified bond maturity is redeemed according to a schedule based on a designated range of prepayment speeds. As long as the actual prepayment rate is within the range, the PAC bond receives these prepayments and other maturities do not. This structure may increase the certainty of the actual life of the PAC bond.

For both of these types of bonds, we review a scenario under which loan prepayments occur at a speed such that the super sinker or PAC bonds are called in full pursuant to the redemption provisions, after which the prepayment rate is reduced to 0%. We use this scenario to assess whether the transaction can support debt service on the remaining bonds, which typically have a higher weighted average coupon.

CALL-PROTECTED, PREMIUM, TAXABLE OR CAPITAL APPRECIATION BONDS (CABS):

In some instances, the structural framework does not permit a trustee to redeem higher coupon debt until all or a portion of the lower coupon bonds are paid off. When this structural feature is present, we review a scenario under which mortgages prepay rapidly, generally at a three-year weighted average life, and the associated funds redeem lower coupon bonds. The prepayment rate is reduced to 0% after the lower coupon bonds have been paid in full. We use this scenario to assess whether the transaction can support debt service on the remaining bonds, which typically have a higher weighted average coupon.

VARYING MORTGAGE RATES (SPLIT RATE):

In what is often referred to as a split-rate scenario, higher rate mortgages experience rapid prepayments, typically at a three-year weighted average life, while lower rate mortgages do not experience any prepayments. The transaction quickly loses the higher source of income and is left with the lower source for an extended period. We typically review a split-rate scenario for transactions where there is at least a 100-basis-point difference between underlying mortgage rates or where at least one mortgage rate is lower than the weighted average bond rate.

MULTI-FAMILY DEFAULT:

In this scenario, which also includes standby credit enhancement instruments, the mortgage loan defaults on the date of the lowest asset-to-debt ratio. As a result, the entire mortgage balance and any accrued interest is paid by the credit enhancement provider, and the transaction experiences negative arbitrage incurred during the maximum notice period prior to redemption.

FHA RISK-SHARING INSURANCE:

The risk-share default scenario is similar to that of the standard cash pay insurance except the full insurance payment is received 90 days from the declared default date.

FHA STANDARD CASH PAY INSURANCE:

The FHA insurance is called upon to cover the insured amount of mortgage principal and interest, and the transaction incurs negative arbitrage throughout the maximum notice period prior to redemption. In this scenario, FHA claims payments in the amount of 90% and 10% of the insured loan balance are received 90 days and 240 days after the mortgage loan is declared in default, respectively. This reflects the uncertainty

as to the timing of FHA claims payments. The corresponding amount of bonds is called after the receipt of each FHA payment, with a maximum notice period to bondholders, and the DSRF is tapped to pay debt service on the bonds prior to redemption. An example of this scenario is given in Exhibit 7.

EXHIBIT 7

Example of FHA Standard Cash Pay Insurance Default Cash Flow Scenario

The following is an example of the timeline for a default on an FHA mortgage loan where debt service is due February 1 and August 1.

August 15	Bond transaction closes.
September 1	Mortgage payment is missed (referred to as the "default date").
October 1	Mortgage is declared in default (referred to as the "declared default date").
November 15	The trustee has a maximum of 45 days from the declared default date to give notice to HUD/FHA regarding its intention to file an insurance claim and election to assign the mortgage to HUD/FHA.
December 30	The mortgage is assigned to HUD/FHA. Shortly after HUD/FHA receives notice of intention to file claim and election to assign mortgage, HUD/FHA sends a letter authorizing assignment of mortgage within 30 days of receipt of the letter.
January 1	The bond transaction receives 90% of FHA benefits 90 days from the declared default date.
January 2	The trustee sends a 60-day notice of redemption to bondholders.
February 1	The DSRF is drawn upon for debt service.
March 2	Call bonds with initial claims payment.
June 1	Receive final 10% of FHA benefits 240 days from declared default date.
June 2	The trustee sends a 60-day notice of redemption to bondholders.
August 1	The DSRF is drawn upon for debt service.
August 2	Call remaining bonds with final claims payment.

FHA STANDARD DEBENTURE PAY SCENARIO:

In this scenario, at the time of an underlying mortgage default, the FHA provides a debenture that pays interest only on the outstanding mortgage balance for a 20-year term with principal due at the debenture's maturity. A mortgage default could occur at a point when interest paid on the debenture (based on the outstanding mortgage principal balance at default) is not sufficient to pay bond principal and interest on an amortizing bond. As a result, the FHA standard debenture pay scenario reflects monthly defaults on the underlying mortgage each payment period through the maturity of the bonds. In effect, this scenario is reviewed for each month that the mortgage loan will be outstanding.

FHA STANDARD DEBENTURE LOCK SCENARIO:

In some cases, a bond transaction secured by FHA-insured mortgages may be issued with an asset-to-debt ratio below 100%; however, the pass-through rate on the mortgages is higher than the interest rate paid on the bonds. In these cases, the transaction terms typically incorporate a debenture lock agreement where HUD agrees not to call the debentures until the transaction's asset-to-debt ratio reaches at least 100%. This feature eliminates the possibility of a bond redemption during a period when pledged assets are less than liabilities and, when present, is incorporated in this scenario. Where there is a debenture lock agreement or a similar mitigant, the sufficiency of cash flows can be met with an asset-to-debt ratio that is less than 100%,

provided that there is in all periods sufficient cash flow from mortgage and investment revenue as well as available cash and reserves to cover debt service obligations and any applicable expenses.

Transaction Extensions

ACQUISITION / CONSTRUCTION PHASE EXTENSIONS:

The acquisition or construction phase of a transaction may be extended to allow more time to originate mortgages or complete project construction. Typical bond features include a requirement to demonstrate cash flow sufficiency in these cases. In the event of an extension, we review a scenario under which the bond transaction experiences the maximum potential negative arbitrage for the remainder of the origination or construction period.

Monthly MBS Structure

In the monthly pass-through MBS structure, in contrast to semi-annual bond debt service transactions, bonds pay interest on a monthly basis and pay down bond principal from mortgage principal payments and prepayments as they are received (no redemption period is required). This structure enables transactions to more closely match the terms of the underlying MBS than do their counterparts with semi-annual debt service payments. The structure's features eliminate the potential for negative arbitrage and significantly reduce vulnerability to administrative error.

For these structures, we generally do not review cash flows with the exception of a non-origination scenario when the monthly structure exhibits all of the following characteristics:

- A single pass-through mortgage rate that is higher than or equal to the single bond rate; or, in the event there are multiple pass-through mortgage rates, the lowest net pass-through mortgage rate is greater than or equal to the highest bond rate.
- The trustee is directed to use MBS principal payments and prepayments to redeem bonds on or before the first day of the following month.
- Absence of a minimum revenue fund balance (all monies pass through to the bonds).
- Absence of a sinking fund redemption schedule.
- Expenses paid from the trust estate, if any, are defined and expressed as a percentage of the MBS outstanding.
- A cash deposit equal to one month of interest at the MBS pass-through mortgage rate is deposited with trustee at the bond closing (to cover the lag until the first day of the following month).

Appendix C: Scenario Analysis for Float or Reserve Fund GICs

For stand-alone housing bond transactions that use float or reserve fund GICs, the rating of the transaction is capped at no more than five alphanumeric notches[13] above the rating of the GIC provider. In order to assess whether the rating cap for the transaction is fewer than five notches above the GIC provider's rating, we perform a scenario analysis to assess what the impact on cash flow would be if a GIC provider fails to meet its obligations.

We perform a scenario analysis assuming the GIC provider's failure occurs in the current year, a separate scenario analysis assuming GIC failure occurs in the following year and so on for each subsequent year through the life of the bonds. We analyze GIC provider failure in each year because the projected loss to the transaction may vary depending on the point in the life cycle of the bonds the failure of the GIC provider occurs.

The rating cap is determined by assessing the GIC provider default scenario with the highest projected loss to bondholders, combined with the rating of the GIC provider.

Assumptions

We apply the following assumptions to our GIC default scenario analysis:

- A loss of 55% of GIC principal at the time of default.
- Replacement of the GIC with one providing a 0% rate of return.
- GIC provider default occurs midway through the accumulation of revenue for a debt service cycle (e.g., at three months for typical semi-annual payment terms).
- For transactions where mortgage prepayments are permitted (e.g., single-family), we consider two prepayment scenarios described in Appendix B:
  - No prepayments (mortgages are paid according to their initial terms).
  - Three-year weighted average loan life.

Calculating Expected Loss

For each GIC default scenario, we calculate the value of the loss to the transaction based on the amount of the float and reserve funds as well as the net present value of the loss, discounted at the weighted average bond coupon rate. We multiply the net present value of the loss by the probability of default associated with the GIC provider's rating, based on Moody's 10-year idealized default probability tables.[14] This calculation provides an expected loss to the transaction for each GIC default scenario, which is then mapped back to a rating equivalent based on Moody's 10-year idealized expected loss tables.[15] The lowest resultant rating equivalent among all of the GIC default scenarios is the basis for determining the rating cap for the transaction.

[13] For example, if the GIC provider's rating is Baa1, five notches above that rating would be Aa2.

[14] *Rating Symbols and Definitions* contains a link to a table of expected default and loss rates. Please see the "Moody's Related Publications" section for a link to that publication.

[15] Cutoff points between alphanumeric equivalents are based on the geo mean of their expected losses.

Assigning the Rating Cap

In all cases, for stand-alone housing bond transactions that use float or reserve fund GICs, the rating cap is set at the lower of (i) five notches above the GIC provider's rating (the Standard Cap) and (ii) either the lowest resultant rating equivalent among all of the GIC default scenarios or, in some circumstances, one notch above that lowest rating equivalent (the Expected Loss Cap).

Where expected loss associated with a GIC default is sufficiently constant over time that the rating equivalent among all of the GIC default scenarios is the same, this rating equivalent is the Expected Loss Cap.

In cases where the rating equivalent associated with the expected loss among the GIC default scenario changes over time, the Expected Loss Cap is set either at the rating equivalent of the scenario with the highest expected loss or one notch higher than that level, depending on when the highest expected loss occurs and the percentage of the debt service that is funded from the GIC over the next three years of the transaction.

If the GIC default scenario with the largest expected loss occurs well in the future, setting the Expected Loss Cap at the rating associated with the highest expected loss could overstate the risk of GIC default. For example, a GIC default in the current year may result in an expected loss to the transaction associated with an A1 Expected Loss Cap. Over time, the expected loss to the transaction may grow as its dependence on funds from the GIC grows, such that in year 15, the expected loss to the transaction is associated with a Baa1 rating cap. The risk of GIC provider failure to the overall transaction is therefore lower in years one through 14, during which time the GIC provider's credit profile could improve. Thus, a Baa1 rating cap could be too conservative. In this case, as the transaction becomes more dependent on GIC interest income and reserve transfers, the loss due to a GIC provider default would increase if the GIC provider's rating stays the same or goes down. In a scenario where expected loss will decrease over time, maintaining the Expected Loss Cap at the current level could also be too conservative.

In order to reflect the credit risk to the transaction when expected loss from a GIC provider default increases over time, we usually set the Expected Loss Cap one notch above the rating equivalent associated with the largest expected loss over the remaining life of the transaction. However, we usually set the Expected Loss Cap at the rating equivalent associated with the largest expected loss when the largest expected loss will occur in the next three years of the transaction[16] and in cases where the funds from the GIC (principal and accumulated interest) cover, on average, 30% or more of debt service payments over the next three years (typically, six semi-annual payment periods).

In order to reflect the credit risk to the transaction when expected loss from a GIC provider default will decrease meaningfully over the medium term, we usually set the Expected Loss Cap one notch above the rating equivalent associated with a GIC provider default in the current year. A meaningful decrease over the medium term means that the rating level associated with the expected loss from a GIC provider default goes up by at least one notch over the next three years of the transaction. However, if funds from the GIC (principal and accumulated interest) cover, on average, 30% or more of debt service payments over the next three years (typically, six semi-annual payment periods), the Expected Loss Cap is usually set at the rating associated with the current year expected loss.

[16] In cases where the rating level associated with the largest expected loss only pertains to a relatively short period of time, for example the last year or two of the transaction, we may not lower the rating cap, which may remain at one notch above the rating level associated with the largest expected loss.

In addition to considering the expected loss analysis, in cases of very high exposure to the GIC provider, we may cap the rating of the transaction at the GIC provider's rating. Generally, we would apply this cap when 55% of the debt service payments over the remaining life of the transaction come from funds held with the GIC provider, but we would typically also consider any variability of the dependence on the GIC provider during the remaining life of the transaction as well as the absolute number of remaining debt service payments.

Example: Expected Loss Increases Throughout the Transaction; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Remains Below 30%

In this example, the rating equivalent associated with the largest expected loss due to a GIC provider default is A2, which occurs during years 27 through 30 of the transaction. In all periods, the dependence on GIC funds to cover the next three years of debt service payments remains below 30%. The cap would remain at A1 throughout the life of the transaction, until year 26, when the expected loss in a GIC provider default over the next three years of the transaction is A2. During year 26, the Expected Loss Rating Cap would typically go down to A2.

Example: Expected Loss Increases Throughout the Transaction; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Rises to 30% or Above

This scenario is the same as the example above except that, starting in year 10, 30% or more of debt service payments over the next three years would be paid with funds from the GIC. In year nine the rating cap would typically be lowered to A2. If the dependence on GIC funds were over 55% during years 28 through 30, in year 26 or 27 we would also consider whether the cap should be lowered to the rating of the GIC provider.[17]

Example: Expected Loss Declines Throughout the Transaction; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Remains Below 30%

In this example, the rating equivalent associated with the largest expected loss due to a GIC provider default is A2, which occurs during years one through five of the transaction, after which the rating equivalent is A1 in years six through 15 and Aa3 in years 16 through 30. In all periods, the dependence on GIC funds to cover the next three years of debt service payments remains below 30%. In this case, the Expected Loss Cap would remain at A2 during years one and two of the transaction. During year three, the Expected Loss Cap would typically be raised, since the rating equivalent associated with the expected loss due to a GIC provider default in the next three years would go up to A1. During year 13, the Expected Loss Cap would typically be raised again, since the rating equivalent associated with the expected loss due to a GIC provider default in the next three years would go up to Aa3. Thereafter, it would normally remain constant.

Example: Expected Loss Declines Throughout the Transaction; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Rises to 30% or Above

This scenario is the same as the example immediately above except that 30% or more of debt service payments during years three through five of the transaction would be paid with funds from the GIC. The Expected Loss Cap would remain at A2 until such time as the expected loss associated with the GIC provider default scenario were equivalent to an A1 or higher for the current year and the succeeding three years.

[17] In the examples that follow, we would also consider whether very high dependence on the GIC provider would cause the rating cap to be lowered to the GIC provider's rating.

Example: Expected Loss Grows and Then Declines; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Remains Below 30%

In this example, the rating equivalent associated with the expected loss to the transaction due to a GIC provider default starts at A2 and grows during years one through seven of the transaction, at which point, the rating equivalent associated with a GIC provider default is Baa3 for years eight through 10. For years 11 through 20 the rating equivalent associated with a GIC provider default is Baa2, and thereafter it is Baa1. In all periods, the dependence on GIC funds to cover the next three years of debt service payments remains below 30%. In this case, the Expected Loss Cap would typically remain at Baa2 for the first 17 years of the transaction. During year 18, the Expected Loss Cap would normally be raised, since the rating equivalent associated with the expected loss due to a GIC provider default rating cap in the next three years would go up to Baa1.

Example: Expected Loss Grows and Then Declines; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Rises to 30% or Above

This scenario is the same as the example immediately above except that 30% or more of debt service payments during years 18 through 20 of the transaction would be paid with funds from the GIC. The Expected Loss Cap would remain at Baa2 until such time as the expected loss associated with the GIC provider default scenario were equivalent to a Baa1 or higher for the current year and the succeeding three years.

Example: Expected Loss Declines and Then Grows; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Remains Below 30%

In this example, the rating equivalent associated with the expected loss to the transaction due to GIC provider default starts at a Baa2 equivalent and declines steadily during years one through 15 of the transaction: Baa1 in years four through six, A3 in years seven through nine, A2 in years 10 through 12 and A1 in years 13 through 15. During years 16 through 30, the expected loss due to a GIC provider default grows slowly and reaches a rating equivalent of A3 only in year 30. In all periods, the dependence on GIC funds to cover the next three years of debt service payments remains below 30%. In this case, the Expected Loss Cap would typically start at Baa1 and would typically be raised to A3 during year four and to A2 during year seven, where it would typically remain for the life of the transaction.

Example: Expected Loss Declines and Then Grows; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Rises to 30% or Above

This scenario is the same as the example immediately above except that, starting in year 21, 30% or more of debt service payments over the next three years would be paid with funds from the GIC. In this case, the Expected Loss Cap would typically start at Baa1 and would typically be raised to A3 during year four and to A2 during year seven, where it would typically remain until year 20, at which time the Expected Loss Cap would typically be lowered to A3.

Reassessing the Rating Cap

We reassess the rating cap upon a change in the rating of the GIC provider. In addition, we typically reassess the cap upon any of the following:

- A material change in future cash flows due to prepayments.

- Termination of the GIC.
- Replacement of the GIC provider with another provider (unless the rating of the provider and the terms of the GIC are identical).

Appendix D: Bankruptcy Mitigation Analysis

Borrower payments to a bond program can come in multiple forms. Most commonly, they are mortgage payments. However, the borrower or another party can also contribute funds to cover negative arbitrage, timing lags or other shortfalls. These payments may be made when the transaction is established, or they may be permitted later in the life of the transaction.

For a transaction to be rated under this methodology, the structural framework must incorporate protective elements in the event of a bankruptcy filing by a party whose payments are not covered by the credit enhancement.

The areas we review are preference and automatic stay. Each of these risks are described in more detail below.

Preference

Payments made to the trustee within 90 days prior to a bankruptcy filing[18] of a party making the payment may be deemed to be a preference by the bankruptcy court and subject to disgorgement.

We consider that this risk has been mitigated in any of the following cases:

- The rating of the party making the payment is at least Baa3 or P-3 at the time the payment is made; or
- We receive and review a legal opinion that supports in clear terms that the transfer is not a preference; or
- In the case of initial payments, the applicable preference period (in most cases, 90 days) has expired before the bond rating is assigned.

Automatic Stay

Automatic stay provisions can prevent creditors from collecting on their claims and can shield a borrower from having to make debt service payments in a bankruptcy. These provisions apply to the borrower's property. If the funds deposited into a bond transaction are considered property of the borrower, the automatic stay would apply in a bankruptcy filing.

We consider the following structures unlikely to be subject to an automatic stay:

Using Letters of Credit

A transaction can use a letter of credit (LOC) issued by an independent financial institution to make payments with the institution's own funds. In some transactions, an LOC is used to cover negative arbitrage or lag. In some cases, the LOC is drawn down in full on the bond closing date. In these cases, we consider that the funds will be available at closing. In other cases, the LOC is drawn down over time, and the LOC issuer's Counterparty Risk Assessment rating acts as a ceiling for the bond's rating during the acquisition or construction period. Following this period, this constraint no longer applies.

[18] The preference period may be within one year before the date of the bankruptcy filing if the party making the payment was at that time an insider, as defined in the Bankruptcy Code.

Selling Premium Bonds or Using Subordinate Bond Proceeds

In some transactions, the negative arbitrage or lag is funded from the premium derived from the bond sale or from the proceeds of a sale of subordinate bonds by the same issuer. In these cases, we typically consider that the related automatic stay risks have been mitigated.

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For data summarizing the historical robustness and predictive power of credit ratings, please click here.

For further information, please refer to *Rating Symbols and Definitions*, which is available here.

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