

# MOODY'S

## INVESTORS SERVICE

### RATING METHODOLOGY

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## Public Sector Pool Programs and Financings Methodology

This rating methodology combines and replaces *U.S. Municipal Pool Program Debt* rating methodology published in March 2013, *U.S. State Revolving Fund Debt* rating methodology published in March 2013, and *Public Sector Pool Financings* published in July 2012. The key revisions for pool program and state revolving fund debt include the use of the same methodological approach and scorecard for both types of programs, conversion of the Management and Governance weighted scorecard factor to a notching factor, and the expansion of the scorecard and credit quality and default tolerance factor down to the Ca category. We also made some other modifications to the scorecard. The key revisions to pool financings include incorporating into the notching guidance the proportionate size and relative credit strength of the pool participant(s) with the lowest credit quality, an increase in the number of possible upward notches, and a change in the treatment of debt service reserve funds.

### Introduction

In this rating methodology, we explain our general approach to assessing credit risk for loans and other debt and debt-like obligations issued by pools of public sector or nonprofit entities globally, including the qualitative and quantitative factors that are likely to affect rating outcomes in this sector. This debt generally falls into two broad categories: pool programs and pool financings.

We discuss the scorecard used for pool programs. The scorecard<sup>1</sup> is a relatively simple reference tool that can be used in most cases to approximate credit profiles in this sector and to explain, in summary form, many of the factors that are generally most important in assigning ratings to pool program debt transactions. The scorecard factors may be evaluated using historical or forward-looking data or both. Our approach to assessing credit risk for pool financing debt transactions does not include the use of a scorecard.

We also discuss other rating considerations, which are factors that are assessed outside the scorecard, usually because the factor's credit importance varies widely among transactions in the sector or because the factor may be important only under certain circumstances or for a subset of transactions. In addition, some of the methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector.<sup>2</sup>

<sup>1</sup> In our methodologies and research, the terms "scorecard" and "grid" are used interchangeably.

<sup>2</sup> A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

Furthermore, since ratings are forward-looking, we often incorporate directional views of risks and mitigants in a qualitative way.

As a result, the scorecard-indicated outcome is not expected to match the actual rating for each issuer or each transaction.

Our presentation of this rating methodology proceeds with (i) the scope of this methodology; (ii) the scorecard framework for pool programs; (iii) a discussion of the scorecard factors for pool programs; (iv) the methodology framework for pool financings; (v) a discussion of the rating factors for pool financings; (vi) other rating considerations that are not reflected in the pool program scorecard or the pool financing framework; (vii) the assignment of issuer-level and instrument-level ratings; (viii) methodology assumptions; and (ix) limitations. In Appendix A, we describe how we use the pool program scorecard to arrive at a scorecard-indicated outcome. Appendix B shows the full view of the scorecard factors, sub-factors, weights and thresholds. In Appendix C, we provide information about the inputs and scenarios incorporated into the cash flow projections that inform our assessment of the cash flow sub-factor for pool programs.

## Scope of This Methodology

This methodology applies to debt obligations issued by pools established by sovereigns, sub-sovereign public sector entities or nonprofit entities globally. This debt generally falls into two broad categories: pool programs and pool financings.

Pool programs generally consist of a portfolio of low-interest loans to municipal or nonprofit entities that are actively managed by an authority established by a sovereign, state, regional or local government, by a nonprofit organization, or, occasionally, by a private third-party manager. Pool programs do not operate under a profit-maximization business model; the fundamental purpose of public sector pool programs is to provide municipal and nonprofit entities with low-interest loans to make public infrastructure improvements. Participant composition of pool programs may change over time.

The primary pledge and source of repayment for pool program debt is the revenue derived from the loan repayments and certain reserves that the pool program maintains; bondholders do not typically have recourse to the government or nonprofit entity that established the pool program authority. If the pool program debt includes an explicit pledge of support by a government or nonprofit entity, we also use the methodology that applies to the entity providing that pledge to the pool program and assign the higher rating that results from the two approaches.

This methodology also applies to state revolving funds (SRFs), which are a subset of pool programs that are organized and managed at the US state level. SRFs issue low-interest loans to US local governments, usually to leverage federal funds to finance projects to provide clean drinking water.

Pool programs typically finance these loans through bond issuances in the public debt markets. Most issuers of pool program and SRF debt are affiliated with state, regional or local governments.

Pool financings generally consist of proportionate debt obligations secured by payments from a group of municipal or nonprofit participants. Pool financings may be used to finance a particular project that benefits the participants, or to finance participants' capital or cash flow needs (e.g., a pooled pension

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](http://www.moodys.com) for the most updated credit rating action information and rating history.

financing). Some pool-financed entities also have operations (e.g., a vocational and technical school) that are covered by the participants. In these cases, the participants have a direct obligation to support their proportionate share of debt service and a collective obligation to fund operating costs.<sup>3</sup> Unlike pool programs, pool financings do not typically benefit from active management.

Participants' shares of a pool financing's debt service do not typically change significantly over time, although some pool financings undergo relatively significant shifts in composition because there are material differences in the amortization of individual participants' obligations to the pool.

We have somewhat different approaches for rating pool programs and for rating pool financings. We use the pool program approach, which includes the use of a scorecard, for pools that are actively managed. We consider a pool to be actively managed if it has the following characteristics:

- » Regular monitoring by management of pool participants' credit quality or financial health.
- » Ability and willingness by management to take necessary actions to pay debt service, including the exercise of remedies to obtain delinquent payments.
- » Management has the authority to refund, restructure or otherwise modify the composition of pool participants.

This methodology does not apply to debt issued by an operating entity serving multiple participants where the participants are not explicitly obligated to pay a proportionate share of the entity's debt service, or where participants' debt service obligations change over time based on utilization or off-take.<sup>4</sup> For example, we use separate methodologies to assign ratings to municipal utility systems or regional school districts where public sector purchasers of the service effectively have a proportionate obligation of both capital and operating costs, but do not explicitly undertake to pay a fixed proportionate share of the entity's debt service. However, for these and other sectors where pooled credit quality is an important consideration, we may use the broad principles and tools described in this methodology in our consideration of an entity's credit risk associated with the purchasers of its services. This methodology also does not apply to US municipal joint action agencies, whose debt is also rated under a separate methodology.<sup>5</sup>

## Pool Programs: Scorecard Framework

For public sector pool programs, our general approach to assessing credit risk includes the use of a scorecard. The scorecard is composed of three weighted factors, some of which comprise a number of sub-factors. The pool programs scorecard also includes two notching factors, which may result in upward or downward adjustments in half-notch increments to the preliminary outcome.

<sup>3</sup> In a pool financing, the operational costs of the entity may be based on participants' utilization; however, as described below, this methodology does not apply to entities that provide services to multiple participants where the share of debt service may vary based on utilization or any factor under the participants' control.

<sup>4</sup> There is one exception. This methodology does apply to regional jail authorities, whose debt service obligations may change over time based on utilization.

<sup>5</sup> Please see our respective methodologies that describe our approach to rating US municipal utility revenue debt, regulated electric and gas utilities, regulated electric and gas networks, and US municipal joint action agencies. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

For pool financings, our approach does not include the use of a scorecard. For information about our general approach to assessing credit risk for pool financings, please see the "Pool Financings: Methodology Framework" and the "Pool Financings: Discussion of the Rating Factors" sections.

## EXHIBIT 1

**Public Sector Pool Programs Scorecard Overview**

Factor	Factor Weighting	Sub-factor	Sub-factor Weighting
Credit Strength and Default Tolerance	50%	Credit Quality and Default Tolerance Score	50%
Diversity of Portfolio	20%	Number of Borrowers	10%
		Percentage of Loan Principal to Borrowers that Represent Less Than 1% of the Pool	5%
		Percentage of Loan Principal to the Top Five Borrowers	5%
Debt Structure	30%	Cash Flows	20%
		Counterparties	10%
<b>Total</b>	<b>100%</b>		<b>100%</b>
<b>Preliminary Outcome</b>			
<b>Notching Factors</b>			<b>Notching Range</b>
Unusually Strong or Weak Management			-2 to +2
Concentration of Pool Participants in a Volatile Sector			-3 to 0
<b>Scorecard-Indicated Outcome</b>			

Source: Moody's Investors Service

Please see Appendix A for general information relating to how we use the scorecard for pool programs and for a discussion of scorecard mechanics. The pool programs scorecard does not include every rating consideration.<sup>6</sup>

## Pool Programs: Discussion of the Scorecard Factors

In this section, we explain our general approach for scoring each scorecard sub-factor or factor, and we describe why they are meaningful as credit indicators.

### Factor: Credit Strength and Default Tolerance (50% Weight)

#### Why It Matters

The credit strength of a pool program's borrowers<sup>7</sup> is an important indicator of the program's resilience to loan defaults and the potential losses to the program in the event of default. Default tolerance provides a critical indication of the program's capacity to make full and timely debt service payments in the event revenue is lost due to loan defaults.

<sup>6</sup> Please see the "Other Rating Considerations" and "Limitations" sections.

<sup>7</sup> In this methodology, the terms "participant" and "borrower" are used interchangeably.

## How We Assess It for the Scorecard

### CREDIT QUALITY AND DEFAULT TOLERANCE SCORE:

#### *Weighted Average Credit Quality*

We assess the credit quality of the borrowers by calculating or estimating their weighted average credit quality. For scoring this sub-factor, we may use public or private credit ratings<sup>8</sup> or certain other methods to estimate credit quality. If the borrower's obligation to the pool program benefits from a state intercept program, we use the higher of the stand-alone rating and the rating of the intercept program. If a US municipal borrower is unrated and its share of the pool program is less than 3%, we may use a scorecard-generated, unpublished, point in time estimate of approximate credit quality, called a Q-score, to assess the municipality's credit quality. For unrated borrowers, including US municipal borrowers whose share is more than 3% of the pool program, we may assign a credit estimate.<sup>9</sup>

Where we do not have sufficient information to assess the credit quality of individual borrowers in a pool program, we calculate or estimate weighted average credit quality in two ways:

- » For each borrower for which we are unable to assess credit quality, we use an assumption of Caa2.
- » In calculating default tolerance, we exclude loan repayment revenues associated with all borrowers for which we are unable to assess credit quality, and we do not incorporate their credit quality into the weighted average calculation.

Provided that the second approach results in a default tolerance that is above 0%, we use the higher score that results from these two approaches. When the second approach results in a default tolerance of 0% or lower, we use the Caa2 assumption. In addition, we consider additional available metrics that indicate the strength of performance of the loan portfolio over time (typically, a history of at least 10 years). These additional metrics include:

- » The percentage of non-performing loans or charge-offs in the portfolio and the trend in portfolio performance.
- » The stability of the default tolerance level.
- » The stability of the other portfolio characteristics over time, including size and concentration.

In cases where the portfolio metrics are weak or deteriorating or where the portfolio does not demonstrate stability, the pool program rating may be significantly lower than the scorecard-indicated outcome.

To arrive at the weighted average credit quality, we multiply each borrower's percentage share of the pooled debt obligation by the 10-year idealized expected loss rate associated with the rating of that borrower (or, where other methods are used to assess credit quality, the equivalent alphanumeric).<sup>10</sup> We

<sup>8</sup> Ratings for borrowers are assigned under the relevant sector methodologies.

<sup>9</sup> Please see our cross-sector rating methodology that describes our approach to the use of credit estimates in rated transactions. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

<sup>10</sup> For a link to the Idealized Cumulative Expected Loss Rates table, please see *Rating Symbols and Definitions*. A link to this publication can be found in the "Moody's Related Publications" section.

add the results and map the sum to the alphanumeric category in the 10-year idealized expected loss table.<sup>11</sup>

### Default Tolerance

In assessing default tolerance, we use pool program projected cash flows<sup>12</sup> to calculate or estimate the maximum percentage of revenue from loan repayments that a pool program could lose and still pay 100% of its debt service through the life of the bonds. Our projections of pool program projected cash flows incorporate other revenues pledged to the program debt (e.g., dedicated tax revenues) as well as reserve funds or other pledged assets that mitigate revenue loss due to loan defaults.

We exclude borrowers with credit quality of Ca or lower from the weighted average credit quality calculation, because Ca implies that these borrower are likely in, or very near, default. We also exclude the revenues associated with those borrowers from the default tolerance calculation or estimate.

We combine these two assessments to arrive at a Credit Quality and Default Tolerance Score, using the matrix shown in Exhibit 2.

EXHIBIT 2

### Credit Quality and Default Tolerance Score Matrix

		Default Tolerance									
		≥ 45%	40%-45%	35%-40%	30%-35%	25%-30%	20%-25%	15%-20%	10%-15%	5%-10%	< 5%
Credit Quality (Weighted Average Credit Quality of Borrowers)	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aa
	Aa	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aa	Aa	Aa	A
	A	Aaa	Aaa	Aaa	Aaa	Aaa	Aa	Aa	A	A	Baa
	Baa	Aaa	Aaa	Aa	Aa	Aa	A	Baa	Baa	Baa	Ba
	Ba	Aa	Aa	A	A	Baa	Baa	Ba	Ba	Ba	B
	B	Aa	A	A	Baa	Baa	Ba	Ba	B	B	Caa
	Caa	Baa	Baa	Baa	Ba	Ba	B	Caa	Caa	Caa	Caa

Source: Moody's Investors Service

The Credit Quality and Default Tolerance Score is the input for the scorecard.

### FACTOR

#### Credit Strength and Default Tolerance (50%)

Sub-factor	Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Credit Quality and Default Tolerance Score	50%	Aaa	Aa	A	Baa	Ba	B	Caa	-

Source: Moody's Investors Service

<sup>11</sup> Cutoff points between alphanumeric equivalents are based on the geo mean of their expected losses.

<sup>12</sup> Please see Appendix C for information about our approach to the inputs and scenarios incorporated into the cash flow projections that inform our assessment.

## Factor: Diversity of Portfolio (20% Weight)

### Why It Matters

A diverse portfolio of borrowers is an important factor supporting a pool program's credit strength. A program with diverse portfolios comprising a large number of borrowers is in a stronger position to absorb loan defaults by individual borrowers. With a smaller, more concentrated pool, there is a greater risk that the default of one or a small number of borrowers will reduce the pool program's capacity to make full and timely debt service payments.

This factor comprises three sub-factors:

#### *Number of Borrowers*

The total number of borrowers in the pool program provides a broad indication of the pool program's ability to pay debt service in the event of a small number of defaults by individual borrowers.

#### *Percentage of Loan Principal to Borrowers that Represent Less Than 1% of the Pool*

The percentage of total pool program loan principal to be repaid by borrowers that each owe less than 1% of total pool program principal provides another indication of portfolio diversity. The more borrowers that owe a small percentage of total pool program principal, the lower the likelihood that a single borrower default will impede the program's ability to pay debt service.

#### *Percentage of Loan Principal to the Top Five Borrowers*

The percentage of loan principal to be repaid by the top five borrowers is important because defaults among the borrowers with the largest loan obligations can disproportionately affect the program's overall ability to pay debt service.

### How We Assess It for the Scorecard

#### **NUMBER OF BORROWERS:**

Our assessment of this sub-factor is based on the total number of borrowers in the pool program.

#### **PERCENTAGE OF LOAN PRINCIPAL TO BORROWERS THAT REPRESENT LESS THAN 1% OF THE POOL:**

The metric is the aggregate percentage of total pool program loan principal to be repaid by borrowers whose individual obligations represent less than 1% of the program's total loan principal.

#### **PERCENTAGE OF LOAN PRINCIPAL TO THE TOP FIVE BORROWERS:**

The metric is the aggregate percentage of total pool program loan principal to be repaid by the five borrowers with the largest loan obligations.

## FACTOR

**Diversity of Portfolio (20%)**

Sub-factor	Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Number of Borrowers <sup>*1</sup>	10%	≥ 100	50 – 100	30 – 50	20 – 30	15 – 20	10 – 15	5 – 10	< 5
Percentage of Loan Principal to Borrowers that Represent Less Than 1% of the Pool <sup>*2</sup>	5%	≥ 25%	20% – 25%	15% – 20%	10% – 15%	5% – 10%	3% – 5%	1% – 3%	< 1%
Percentage of Loan Principal to the Top 5 Borrowers <sup>*3</sup>	5%	≤ 30%	30% – 40%	40% – 50%	50% – 60%	60% – 70%	70% – 80%	80% – 90%	> 90%

\*1 For the linear scoring scale, the Aaa endpoint value is 120. A value of 120 or better equates to a numeric score of 0.5. The Ca endpoint value is zero. A value of zero equates to a numeric score of 20.5.

\*2 For the linear scoring scale, the Aaa endpoint value is 50%. A value of 50% or better equates to a numeric score of 0.5. The Ca endpoint value is 0%. A value of 0% equates to a numeric score of 20.5.

\*3 For the linear scoring scale, the Aaa endpoint value is 5%. A value of 5% equates to a numeric score of 0.5. The Ca endpoint value is 100%. A value of 100% equates to a numeric score of 20.5.

Source: Moody's Investors Service

**Factor: Debt Structure (30% Weight)****Why It Matters**

A pool program's debt structure, as reflected in the relationship of cash outflows related to debt service and cash inflows resulting from interest revenue and loan repayments, and the credit quality of its counterparties are important indications of a pool program's ability to cover its debt obligations with cash flows and other financial resources.

This factor comprises two sub-factors:

*Cash Flows*

Pool program cash flows and the stability of debt service coverage over time provide insight into the structure of the pool program and its ability to pay debt service under various stressful scenarios.

*Counterparties*

Pool programs enter into agreements with various counterparties, including investment providers and, for programs with variable-rate bonds, liquidity providers and swap counterparties. The credit quality of a pool program's counterparties is an important consideration because exposure to one or more weak counterparties increases the risk to the program of investment losses or the termination of any liquidity or swap agreements, which could result in an unexpected shortfall in liquidity or a structural mismatch between investment revenue and debt service.

**How We Assess It for the Scorecard****CASH FLOWS:**

We assess the pool program's ability to pay debt service through the life of the bonds under a base case and various stress scenarios, such as the impact of different interest rates (including variable rates) and different investment rates on projected cash flow.<sup>13</sup> We also consider whether there are mismatches between the cash inflows related to the pool's loans and investments and the debt service owed by the pool program, including bond amortizations, and the impact of any mismatches on

<sup>13</sup> Please see Appendix C for information about our approach to the inputs and scenarios incorporated into the cash flow projections that inform our assessment.



projected aggregate cash flow. We may apply additional stress scenarios for unusual asset or debt structures.

**COUNTERPARTIES:**

In assessing this sub-factor, we consider the credit quality of the counterparties, as indicated by their credit ratings. When the investment provider is an insurance company, we use the Insurance Financial Strength Rating as the counterparty rating. When the investment provider is a bank, we use the bank's long-term deposit rating as the counterparty rating. For providers of swaps, letters of credit, standby bond purchase agreements and collateralized repurchase agreements, we use the Counterparty Risk Assessment as the counterparty rating.

We also consider the level of concentration of counterparties, with a distribution among several separate counterparties typically corresponding to a stronger assessment.

## FACTOR

**Debt Structure (30%)**

Sub-factor	Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Cash Flows	20%	Cash flow provides extremely high coverage of starting debt service, and coverage consistently rises through the life of the transaction.	Cash flow provides high coverage of starting debt service but coverage may fluctuate through the life of the transaction; coverage generally remains high.	Cash flow provides moderate coverage of debt service but coverage may be highly volatile through the life of the transaction, or coverage does not rise substantially over the life of the transaction; cash flow coverage may approach 1.0x in later years under certain stress scenarios, but never falls below 1.0x.	Cash flow coverage may be just above 1.0x in early periods in the base case scenario and may drop slightly below 1.0x under stress scenarios.	Cash flow coverage is consistently just above 1.0x in the base case and drops moderately below 1.0x under stress scenarios.	Cash flow coverage consistently drops below 1.0x in the base case and drops significantly below 1.0x under stress scenarios.	Cash flow coverage consistently drops below 1.0x in the base case and drops sharply below 1.0x under stress scenarios.	Cash flow has little to no ability to absorb financial stress.
Counterparties	10%	All counterparties are rated Aa or Aaa; and counterparty exposure is extremely well distributed, or investments are all in short-term obligations of, or deposits with, the sovereign (e.g., US Treasury securities) or the central bank.	All counterparties are rated A1 or higher; and counterparty exposure is very well distributed.	Most counterparties are rated A3 or higher; and counterparty exposure is well distributed.	Most counterparties are rated Baa or higher; and counterparty exposure is somewhat distributed.	All counterparties are rated Ba or higher; or counterparty exposure is concentrated.	Some counterparties are rated B or lower; or counterparty exposure is very concentrated.	Some counterparties are in default; or counterparty exposure is very concentrated.	Most counterparties are in default.

Source: Moody's Investors Service

**Notching Factors**

The scorecard includes notching factors. Notching factors have the effect of adjusting, either upward or downward, the preliminary outcome that results from the Credit Quality and Default Tolerance, Diversity of Portfolio, and Debt Structure factors. Adjustments may be made in half-notch increments, based on the notching factors listed in the table below. In aggregate, the notching factors can result in a total of up to two upward notches or up to five downward notches from the preliminary outcome to

arrive at the scorecard-indicated outcome. In cases where we consider that the credit weakness or credit strength represented by a notching factor, or by these factors in aggregate, is greater than the scorecard range, we incorporate this view into the rating, which may be different from the scorecard-indicated outcome.

Notching Factor	Notching Range
Unusually Strong or Weak Management	-2 to +2
Concentration of Pool Participants in a Volatile Sector	-3 to 0

Source: Moody's Investors Service

## Unusually Strong or Weak Management

### Why It Matters

Unusually strong or weak management is important because the quality of management can reinforce or undermine the credit strength of a pool program. For example, very strong management may provide significant oversight that supports a strong portfolio of borrowers or that quickly identifies borrowers in financial distress. Conversely, very weak management may allow the pool program structure to weaken, resulting in deteriorating coverage of debt service by loan revenue and other sources.

### How We Assess It for the Scorecard

In assessing this factor, we typically consider the pool program's management and governance structure as well as management's policies and practices, including those related to oversight, financial and risk management, and requirements for borrowers. This notching factor may result in an upward or downward adjustment of up to two notches.

## Concentration of Pool Participants in a Volatile Sector

### Why It Matters

Concentration of pool program participants in a volatile sector can result in rapid fluctuations in the overall credit quality of the program. For example, pool programs whose participants are concentrated in sectors such as charter schools are more likely to have a meaningful number of borrowers with less stable credit quality than programs whose borrowers are concentrated in more stable sectors, such as counties or cities.

### How We Assess It for the Scorecard

In assessing this factor, we typically consider the proportion of borrowers in sectors with more volatile credit quality. These sectors include those that are not directly managed by government entities and those where the government's obligation is limited to a pledge of more volatile revenues, and (in each case) where there is a relatively high risk of financial distress or insolvency. This notching factor may result in a downward adjustment to the preliminary outcome of up to three notches, but in most cases no more than two notches.

## Pool Financings: Methodology Framework

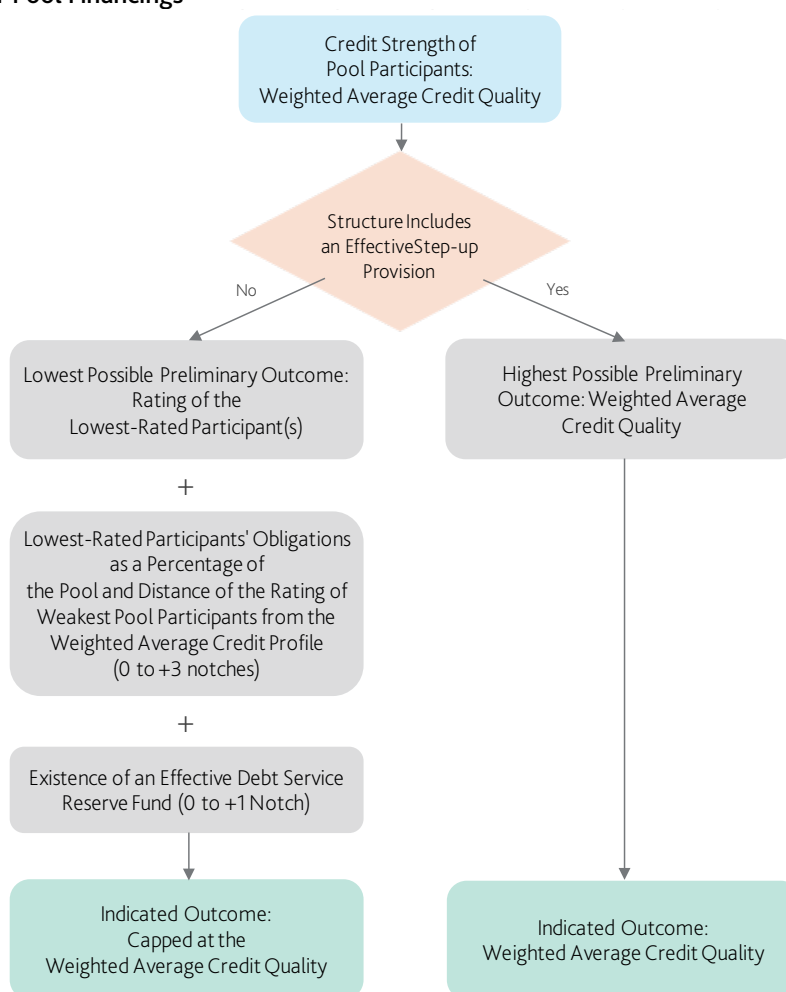
The methodology framework for pool financings is composed of four factors. Two factors — the Credit Strength of Pool Participants factor and the Structure Includes an Effective Step-up Provision factor — are used to arrive at a pool financing's lowest and highest possible preliminary outcomes (see Exhibit 3).

We may notch the pool financing's lowest possible preliminary outcome upward, based on two sub-factors: the Lowest-Rated Participants' Obligations as a Percentage of the Pool sub-factor and the Distance of the Rating of Weakest Pool Participants from the Weighted Average Credit Quality sub-factor. The Existence of an Effective Debt Service Reserve Fund (DSRF) factor may result in an additional upward notch.

The indicated outcome may be only as high as the highest possible preliminary outcome (i.e., the weighted average credit quality).

EXHIBIT 3

### Public Sector Pool Financings



Source: Moody's Investors Service

## Pool Financings: Discussion of the Rating Factors

In this section, we explain our general approach for assessing each sub-factor or factor, and we describe why they are meaningful as credit indicators.

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### Factor: Credit Strength of Pool Participants

#### Why It Matters

The credit strength of the pool participants is an important indicator of the likelihood that participants will meet their obligations to the pool financing and the potential losses to the transaction in the event of participant defaults.

#### How We Assess It

We assess the credit strength of the pool participants by calculating or estimating their weighted average credit quality, which is the highest possible preliminary outcome. To arrive at the weighted average credit quality, we multiply each participant's percentage share of the pool financing by the 10-year idealized expected loss rate associated with the relevant rating (or credit assessment equivalent) for that participant.<sup>14</sup> We add the results and map the sum to the alphanumeric category in the 10-year idealized expected loss table.<sup>15</sup>

For pool financings that include an effective step-up provision, the weighted average credit quality is the indicated outcome. For information about how we assess step-up provisions, please see the "Structure Includes an Effective Step-Up Provision" factor discussion below.

For pool financings that do not include an effective step-up provision, we use the rating (or credit assessment equivalent) of the lowest-rated participant(s) in the pool financing, which is the lowest possible preliminary outcome. Unenhanced pool financings generally have little to no tolerance for a default by any participant; therefore, we use the likelihood of default for the participant(s) with the lowest credit quality as a proxy for the likelihood that the pool financing will default.

For pool financings without effective step-up provisions, the indicated outcome may be up to four notches above the lowest possible preliminary outcome, based on the Proportionate Size and Relative Credit Strength of Lowest-Rated Pool Participants factor, which comprises two sub-factors, and the Existence of an Effective Debt Service Reserve Fund factor (discussed in the following sections).

The credit ratings we use to assess the credit strength of the pool participants may be public or private. For pool financings that include an effective step-up provision (where the indicated outcome is based on the weighted average of participant credit quality), if a participant is unrated and its share of the pool financing is less than 3%, we may use a scorecard-generated, unpublished, point in time estimate of approximate credit quality, called a Q-score, to assess the municipality's credit quality. For unrated participants, including US municipal participants whose share is more than 3% of the pool financing, we may assign a credit estimate.<sup>16</sup> For pool financings that do not include an effective step-up

<sup>14</sup> Ratings for participants are assigned under the relevant sector methodologies. For a link to the Idealized Cumulative Expected Loss Rates table, please see *Rating Symbols and Definitions*. A link to this publication can be found in the "Moody's Related Publications" section.

<sup>15</sup> Cutoff points between alphanumeric equivalents are based on the geometric mean of their expected loss.

<sup>16</sup> Please see our cross-sector rating methodology that describes our approach to the use of credit estimates in rated transactions. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

provision (where the indicated outcome is based on the lowest-rated participant(s)), we use public or private ratings or credit estimates for all participants.

For pool financings where Moody's is unable to adequately assess the credit quality of individual unrated participants, we assume the unrated participants have a Caa2 rating (or credit assessment equivalent).

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### **Factor: Structure Includes an Effective Step-Up Provision**

#### **Why It Matters**

Pool financings that include an effective step-up provision are in stronger financial positions to pay debt service on time and in full in the case of a default by one or multiple participants in the pool.

An effective step-up provision requires pool participants to increase their respective share of the obligation to the pool financing to cover the obligation of a defaulted participant(s). The existence of an effective step-up provision is important because it can greatly mitigate the risk that a default by a participant will result in a loss to, or a default by, the pool financing transaction. Step-up provisions are generally structured so that debt service continues to be paid in full through the life of the pool financing transaction despite a default by one or more participants.

#### **How We Assess It**

We assess whether the structure includes a step-up provision and its effectiveness, i.e., whether it fully mitigates the default of any participants. Where we consider a step-up provision effective, the indicated outcome is the highest possible preliminary outcome, which is the weighted average credit quality of the pool.

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### **Factor: Proportionate Size and Relative Credit Strength of Lowest-Rated Pool Participants**

#### **Why It Matters**

The proportional amount of the lowest-rated participant(s)' obligations to the pool as well as the credit strength of the lowest-rated participant(s) relative to the weighted average credit strength of all the participants in the pool provide important indicators that supplement the weighted average credit quality of the pool. These sub-factors provide insights into the composition of the pool, in particular the weakest members in the pool, which have the highest likelihood of default. Within a pool of obligations, the existence of stronger borrowers does not change the likelihood that weaker borrowers will default, nor does it change the loss to the pool upon a default of any of those participants.

This factor comprises two sub-factors:

#### *Lowest-Rated Participants' Obligations as a Percentage of the Pool*

The percentage of total pool principal owed by the lowest-rated participant borrower(s) is important because the lowest-rated participant borrower(s) has the highest likelihood of default and, in the case of such a default, the extent of the expected loss to the pool financing would be based on the pool's total exposure to that participant borrower.

For example, a pool financing whose lowest-rated participant borrower(s) is rated Baa1 and represents 10% of the pool principal would have higher expected loss than a pool financing whose lowest-rated

participant borrower(s) is also rated Baa1 but represents 5% of pool principal, assuming the credit quality of the remainder of the pool participants is the same for both pools.

#### *Distance of the Rating of Weakest Pool Participants from the Weighted Average Credit Quality*

The distance in notches between the lowest-rated participant's rating (or credit assessment equivalent) and the weighted average credit quality of the pool provides an important indication of the dispersion of credit quality of the participants in the pool. Two pools could have the same overall weighted average credit quality, but a very different composition of participants and dispersion of their individual credit quality around the weighted average. Lower-rated participants are more likely to default and have an outsized influence on the pool financing's likelihood of default and expected loss. In some cases, the pool financing would be likely to default if a single participant were to default on its loans.

#### How We Assess It

##### **LOWEST-RATED PARTICIPANTS' OBLIGATIONS AS A PERCENTAGE OF THE POOL:**

The metric is the sum of the obligations (in percentage terms) of all participants with the lowest rating (or credit assessment equivalent) relative to the total obligation of all participants.

##### **DISTANCE OF THE RATING OF WEAKEST POOL PARTICIPANTS FROM THE WEIGHTED AVERAGE CREDIT QUALITY:**

We use the number of alphanumeric notches between the rating (or credit assessment equivalent) of the lowest-rated participant(s) and the weighted average credit quality of the pool participants.<sup>17</sup>

#### Combining the Two Sub-factors

For pools without effective step-up provisions, our assessments of these two sub-factors may result in an upward adjustment of up to three notches from the lowest possible preliminary outcome, based on the matrix shown in Exhibit 4. There may be an additional upward adjustment of one notch, based on the existence of a DSRF (please see the "Existence of an Effective Debt Service Reserve Fund" factor discussion below). The result is the preliminary outcome, which is further capped by the weighted average credit quality of the pool participants.

EXHIBIT 4

#### Typical Upward Notching

Lowest-Rated Participant(s)' Obligations as Percentage of the Pool					
Distance of the Rating of Weakest Pool Participant(s) from the Weighted Average Credit Quality		≤ 15%	15% - 25%	25% - 50%	> 50%
	1 Notch	1	1	1	0
	2 Notches	2	2	1	0
	3 Notches and above	3	2	2	1

Source: Moody's Investors Service

<sup>17</sup> Cutoff points between alphanumeric equivalents are based on the geo mean of their expected losses.

## Factor: Existence of an Effective Debt Service Reserve Fund

### Why It Matters

A DSRF, as part of a pool financing structure, may mitigate the late payment or nonpayment of one or more participants. DSRFs may ensure that debt service continues to be paid through the life of the pool financing transaction or may only temporarily delay default and loss.

### How We Assess It

We assess whether a pool financing's DSRF is effective at mitigating the risk of late or nonpayment of debt service due to the default of a participant(s) on its pool obligations. We consider a DSRF effective if the reserve is sufficient to cover five years of missed debt service payments by the participant(s) with the lowest rating or credit assessment equivalent.

The existence of an effective DSRF may result in an additional notch of uplift from the rating of the lowest-rated participant(s), in addition to any upward notches under the Proportionate Size and Relative Credit Strength of Lowest-Rated Pool Participants factor. However, the existence of a DSRF would not result in an indicated outcome above the highest possible preliminary outcome (i.e., the weighted average credit quality of the pool participants).

## Other Considerations

Ratings may include additional factors that are not in the pool program scorecard or pool financing standard factors, usually because the factor's credit importance varies widely among the issuers or transactions in the sector or because the factor may be important only under certain circumstances or for a subset of issuers or transactions. Such factors include financial controls and the quality of financial reporting; legal structure; the quality and experience of management; assessments of governance as well as environmental and social considerations; and possible government interference in some countries. Regulatory, litigation, liquidity and technology risk as well as changes in demographic and macroeconomic trends also affect ratings.

Following are some examples of additional considerations that may be reflected in our ratings and that may cause ratings to be different from the scorecard-indicated outcome for pool programs or the indicated outcome for pool financings.

### Pool Programs with a Close Relationship with a Strong or Weak Government Sponsor

Many pool programs are governed by, or closely related to, a state, regional or local government sponsor that may demonstrate significant credit and financial strength or weakness. The quality of this relationship, as well as the strength or weakness of the sponsor, may have an impact on the pool program's rating. For example, a strong government sponsor may provide financial or other assistance to a pool program facing shortfalls in loan revenue. Conversely, a weak government sponsor may divert pool program resources to pay expenses for unrelated programs. In assessing the impact that a government sponsor can have on a pool program's finances, we typically consider the nature of the pool program's relationship with the government sponsor, its authority to interfere with the pool program's governance and management, and the overall credit and financial strength of the sponsor.

### Pool Financings with Operating Risk

Pool financings that are used to fund entities that provide services to the participants may be exposed to operating risk. For example, a pool financing could be used to make improvements to a public



enterprise that provides water service to the participants. Although the participants are explicitly obligated to pay a proportionate share of the entity's debt service and operating costs, an overall failure of operations to meet the participant's service needs could result in a reduced willingness by the participants to meet their obligation to the pool financings. Ratings may be lower than the indicated outcome where we assess operating risk of the enterprise to be high.

### Pool Financings with Changing Compositions

The participant composition of most pool financings remains relatively static through the life of the debt transactions. However, for some pool financings, participant obligations amortize at varying rates, resulting in shifting participant composition over time that could result in a change in the weighted average credit quality or proportionate share of the lowest-rated participant(s). Ratings may be higher or lower than the indicated outcome where predictable changes in participant composition result in a change in future indicated outcomes.

### Regulatory Considerations

Pool program and financing issuers and participants are subject to varying degrees of regulatory oversight. Effects of these regulations may entail higher costs and higher potential for technology disruptions. Regional differences in regulation, implementation or enforcement may advantage or disadvantage particular issuers.

Our view of future regulations plays an important role in our expectations of future financial metrics as well as our confidence level in the ability of an issuer or transaction to generate sufficient cash flows relative to its debt burden over the medium and longer term. Regulatory considerations also play a role in our assessment of a pool program's or financing's participant credit quality. For example, changes in the tax-exempt status of US local government debt could increase the cost of borrowing for pool participants. In some circumstances, regulatory considerations may also be a rating factor outside the scorecard, for instance when regulatory change is swift.

### Environmental, Social and Governance Considerations

Environmental, social and governance (ESG) considerations may affect the ratings of pool program and financing issuers. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.<sup>18</sup>

Over time, the economic resiliency and financial strength of pool participants could be affected by environmental risks, which may weaken a participant's economic base and financial stability. We also consider social issues that could materially affect the likelihood of default and severity of loss. For example, we may assess the fiscal, economic and political implications of poverty, social inequality, or violence and crime on economic competitiveness and growth of pool participants. Governance and oversight issues can affect the pool, including how well it adheres to its mandate and risk parameters, and the level of support or negative interference by the sponsor.

### Financial Controls

We rely on the accuracy of audited financial statements to assign and monitor ratings in this sector. The quality of financial statements may be influenced by internal controls, including the proper tone at the top, centralized operations, and consistency in accounting policies and procedures. Auditors'

<sup>18</sup> A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

comments in financial reports and unusual restatements of financial statements or delays in regulatory filings may indicate weaknesses in internal controls.

### Management Strategy

The quality of management is an important factor supporting an issuer's credit strength. Assessing the execution of strategic plans over time can be helpful in assessing management's strategies, policies and philosophies and in evaluating management performance relative to our projections. Management's track record of adhering to stated plans, commitments and guidelines provides insight into management's likely future performance, including in stressed situations.

### Liquidity

Liquidity is an important rating consideration for all public sector pools, although it may not have a substantial impact in discriminating between two issuers with a similar credit profile. Liquidity can be particularly important when there are meaningful mismatches in the timing of cash receipts and cash outlays. We form an opinion on likely near-term liquidity requirements from the perspective of both sources and uses of cash. Ratings can be heavily affected by extremely weak liquidity. For additional insight into general principles for assessing liquidity, please see our liquidity cross-sector methodology.<sup>19</sup>

### Event Risk

We also recognize the possibility that an unexpected event could cause a sudden and sharp decline in an issuer's fundamental creditworthiness, which may cause actual ratings to be lower than the scorecard-indicated outcome. Event risks are varied and can include natural disasters, legal judgments, pandemic, security incidents and abrupt changes in state or federal law. Some other types of event risks include litigation and significant cyber-crime events.

## Assigning Issuer-Level and Instrument-Level Ratings

After considering the scorecard- or indicated outcome, other rating considerations and relevant cross-sector methodologies, we typically assign a senior instrument-level rating or an issuer rating. Individual debt instrument ratings may be notched down from the senior instrument-level rating. For pool programs designated as government-related issuers (GRIs), we may assign a Baseline Credit Assessment.<sup>20</sup>

Occasionally, a pool program or pool financing issuer may issue a debt series with different liens on pool revenue. Senior debt has a first lien on pool revenue and subordinate debt has a junior lien; sometimes, an additional series of debt will be issued with a third lien or lower. We assess the effect of subordination based on analysis of the revenue coverage for all debt classes as well as the coverage of senior and subordinate debt classes by pool revenue net of debt service on each prior lien. We may notch subordinate debt down by one notch or more per debt class if our analysis shows material increased risk of default and loss to debt with subordinate liens.

<sup>19</sup> A link to a list of our cross-sector methodologies can be found in the "Moody's Related Publications" section.

<sup>20</sup> For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology for government-related issuers. A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's Related Publications" section.

## 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 scorecard 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 scorecard and to the overall rating methodology.

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### Limitations of the Scorecard

There are various reasons why scorecard-indicated outcomes may not map closely to actual ratings.

The scorecard in this rating methodology is a relatively simple tool focused on indicators for relative credit strength. Credit loss and recovery considerations, which are typically more important as an issuer gets closer to default, may not be fully captured in the scorecard. The scorecard is also limited by its upper and lower bounds, causing scorecard-indicated outcomes to be less likely to align with ratings for issuers at the upper and lower ends of the rating scale.

The weights for each sub-factor and factor in the scorecard represent an approximation of their importance for rating decisions across the sector, but the actual importance of a particular factor may vary substantially based on an individual issuer's circumstances.

Factors that are outside the scorecard, including those discussed above in the "Other Rating Considerations" section, may be important for ratings, and their relative importance may also vary from issuer to issuer. In addition, certain broad methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector.<sup>21</sup> Examples of such considerations include the following: how sovereign credit quality affects non-sovereign issuers, the assessment of credit support from other entities, the relative ranking of different classes of debt, and the assignment of short-term ratings.

We may use the scorecard over various historical or forward-looking time periods. Furthermore, in our ratings we often incorporate directional views of risks and mitigants in a qualitative way.

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### 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. Issuers or transactions in the sector may face new risks or

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<sup>21</sup> A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

new combinations of risks, and they may develop new strategies 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 pool program or pool financing's future performance; however, as the forward horizon lengthens, uncertainty increases and the utility of precise estimates, as scorecard and factor inputs or in other rating considerations, typically diminishes. In any case, predicting the future is subject to substantial uncertainty.

## Appendix A: Pool Programs — Using the Scorecard to Arrive at a Scorecard-Indicated Outcome

### 1. Measurement or Estimation of Factors in the Scorecard

In the "Discussion of the Scorecard Factors" section, we explain our analytical approach for scoring each scorecard sub-factor or factor,<sup>22</sup> and we describe why they are meaningful as credit indicators.

The information used in assessing the sub-factors is generally found in or calculated from information in the issuer's financial statements or regulatory filings, derived from other observations or estimated by Moody's analysts. We may also incorporate non-public information.

Our ratings are forward-looking and reflect our expectations for future financial and operating performance. However, historical results are helpful in understanding patterns and trends of an issuer's performance as well as for peer comparisons. Financial ratios, unless otherwise indicated, are typically calculated based on an annual or 12-month period. However, the factors in the scorecard can be assessed using various time periods. For example, rating committees may find it analytically useful to examine both historical and expected future performance for periods of several years or more.

The quantitative credit metrics used in this methodology may incorporate analytical adjustments that are specific to a particular transaction.

### 2. Mapping Scorecard Factors to a Numeric Score

After estimating or calculating each sub-factor, the outcomes for each of the sub-factors are mapped to a broad Moody's rating category (Aaa, Aa, A, Baa, Ba, B, Caa or Ca, also called alpha categories) and to a numeric score.

Qualitative factors and sub-factors are scored based on the description by broad rating category in the scorecard. The numeric value of each alpha score is based on the scale below.

Aaa	Aa	A	Baa	Ba	B	Caa	Ca
1	3	6	9	12	15	18	20

Source: Moody's Investors Service

Quantitative factors and sub-factors are scored on a linear continuum. For each metric, the scorecard shows the range by alpha category. We use the scale below and linear interpolation to convert the metric, based on its placement within the scorecard range, to a numeric score, which may be a fraction. As a purely theoretical example, if there were a ratio of revenue to interest for which the Baa range was 50x to 100x, then the numeric score for an issuer with revenue/interest of 99x, relatively strong within this range, would score closer to 7.5, and an issuer with revenue/interest of 51x, relatively weak within this range, would score closer to 10.5. In the text or table footnotes, we define the endpoints of the line (i.e., the value of the metric that constitutes the lowest possible numeric score, and the value that constitutes the highest possible numeric score).

Aaa	Aa	A	Baa	Ba	B	Caa	Ca
0.5 - 1.5	1.5 - 4.5	4.5 - 7.5	7.5 - 10.5	10.5 - 13.5	13.5 - 16.5	16.5 - 19.5	19.5 - 20.5

Source: Moody's Investors Service

<sup>22</sup> When a factor comprises sub-factors, we score at the sub-factor level. Some factors do not have sub-factors, in which case we score at the factor level.

### 3. Determining the Overall Scorecard-Indicated Outcome

The numeric score for each sub-factor (or each factor, when the factor has no sub-factors) is multiplied by the weight for that sub-factor (or factor), with the results then summed to produce an aggregate numeric score before notching factors (the preliminary outcome). We then consider whether the preliminary outcome that results from the three weighted factors should be notched upward or downward<sup>23</sup> in order to arrive at an aggregate numeric score after notching factors, based on Unusually Strong or Weak Management and Concentration of Pool Participants in a Volatile Sector. In aggregate, the notching factors can result in a total of up to two upward notches or up to five downward notches from the preliminary outcome to arrive at the scorecard-indicated outcome.

The aggregate numeric score before and after notching factors is mapped to an alphanumeric. For example, an issuer with an aggregate numeric score before notching factors of 11.7 would have a Ba2 preliminary outcome, based on the ranges in the table below. If the combined notching factors totaled two upward notches, the aggregate numeric score after notching factors would be 9.7, which would map to a Baa3 scorecard-indicated outcome.

EXHIBIT 5

#### Scorecard-Indicated Outcome

Scorecard-Indicated Outcome	Aggregate Numeric Score
Aaa	$x \leq 1.5$
Aa1	$1.5 < x \leq 2.5$
Aa2	$2.5 < x \leq 3.5$
Aa3	$3.5 < x \leq 4.5$
A1	$4.5 < x \leq 5.5$
A2	$5.5 < x \leq 6.5$
A3	$6.5 < x \leq 7.5$
Baa1	$7.5 < x \leq 8.5$
Baa2	$8.5 < x \leq 9.5$
Baa3	$9.5 < x \leq 10.5$
Ba1	$10.5 < x \leq 11.5$
Ba2	$11.5 < x \leq 12.5$
Ba3	$12.5 < x \leq 13.5$
B1	$13.5 < x \leq 14.5$
B2	$14.5 < x \leq 15.5$
B3	$15.5 < x \leq 16.5$
Caa1	$16.5 < x \leq 17.5$
Caa2	$17.5 < x \leq 18.5$
Caa3	$18.5 < x \leq 19.5$
Ca	$19.5 < x \leq 20.5$
C	$x > 20.5$

Source: Moody's Investors Service

<sup>23</sup> Numerically, a downward notch adds 1 to the score, and an upward notch subtracts 1 from the score.

In general, the scorecard-indicated outcome is oriented to a debt instrument with a senior pledge on pool revenue,<sup>24</sup> the issuer rating, or for issuers designated as GRIs, a BCA.

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<sup>24</sup> Generally, the senior pledge represents the largest share of the pool's debt

## Appendix B: Pool Program Scorecard

	Factor or Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
<b>Factor 1: Credit Strength and Default Tolerance (50%)</b>									
Credit Quality and Default Tolerance Score	50%	Aaa	Aa	A	Baa	Ba	B	Caa	-
<b>Factor 2: Diversity of Portfolio (20%)</b>									
Number of Borrowers <sup>*1</sup>	10%	≥ 100	50 – 100	30 – 50	20 – 30	15 – 20	10 – 15	5 - 10	< 5
Percentage of Loan Principal to Borrowers that Represent Less than 1% of the Pool <sup>*2</sup>	5%	≥ 25%	20% – 25%	15% – 20%	10% - 15%	5% - 10%	3% - 5%	1% - 3%	< 1%
Percentage of Loan Principal to the Top 5 Borrowers <sup>*3</sup>	5%	≤ 30%	30% – 40%	40% - 50%	50% - 60%	60% - 70%	70% - 80%	80% - 90%	> 90%
<b>Factor 3: Debt Structure (30%)</b>									
Cash Flows	20%	Cash flow provides extremely high coverage of starting debt service, and coverage consistently rises through the life of the transaction.	Cash flow provides high coverage of starting debt service but coverage may fluctuate through the life of the transaction; coverage generally remains high.	Cash flow provides moderate coverage of debt service but coverage may be highly volatile through the life of the transaction, or coverage does not rise substantially over the life of the transaction; cash flow coverage may approach 1.0x in later years under certain stress scenarios, but never falls below 1.0x.	Cash flow coverage may be just above 1.0x in early periods in the base case scenario and may drop slightly below 1.0x under stress scenarios.	Cash flow coverage is consistently just above 1.0x in the base case and drops moderately below 1.0x under stress scenarios.	Cash flow coverage consistently drops below 1.0x in the base case and drops significantly below 1.0x under stress scenarios.	Cash flow coverage consistently drops below 1.0x in the base case and drops sharply below 1.0x under stress scenarios.	Cash flow has little to no ability to absorb financial stress.



Counterparties	10%	All counterparties are rated Aa or Aaa; and counterparty exposure is extremely well distributed, or investments are all in short- term obligations of, or deposits with, the sovereign (e.g., US Treasury securities) or the central bank	All counterparties are rated A1 or higher. Counterparty exposure is very well distributed.	Most counterparties are rated A3 or higher; and counterparty exposure is well distributed.	Most counterparties are rated Baa or higher; and counterparty exposure is somewhat distributed.	All counterparties are rated Ba or higher; or counterparty exposure is concentrated.	Some counterparties are rated B or lower; or counterparty exposure is very concentrated.	Some counterparties are in default; or counterparty exposure is very concentrated.	Most counterparties are in default.
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### Notching Factors

Unusually Strong or Weak Management	(-2 to +2)
Concentration of Pool Participants in a Volatile Sector	(-3 to 0)

\*1 For the linear scoring scale, the Aaa endpoint value is 120. A value of 120 or better equates to a numeric score of 0.5. The Ca endpoint value is 0. A value of 0 equates to a numeric score of 20.5.

\*2 For the linear scoring scale, the Aaa endpoint value is 50%. A value of 50% or better equates to a numeric score of 0.5. The Ca endpoint value is 0%. A value of 0% equates to a numeric score of 20.5.

\*3 For the linear scoring scale, the Aaa endpoint value is 5%. A value of 5% equates to a numeric score of 0.5. The Ca endpoint value is 100%. A value of 100% equates to a numeric score of 20.5.

Source: Moody's Investors Service

## Appendix C: Cash Flow Inputs and Projection Scenarios

This appendix provides information about our approach to the inputs and scenarios incorporated into the cash flow projections that inform our assessment of a pool program's financial position.

Cash flow projections incorporate input assumptions for rates on loans and investment income, and stress scenarios for interest rates and remarketing spreads, as well as for the repayment terms for bank bonds. Based on the terms and conditions of an individual pool program, we may modify the inputs or consider additional cash flow scenarios in our assessments.

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### Cash Flow Inputs and Scenarios

We use inputs as described in the bond documents, or in the pool program issuer's policies and procedures, including the loan rates and terms, and reinvestment rates. In this section, we discuss the inputs to the cash flow projections for a pool program. Not all inputs are relevant to an individual transaction.

#### Loan Rates and Terms

Cash flow projections typically reflect the revenue generated by the outstanding loans pledged to the pool program. For new loans, which will typically be made from proceeds of new bond sales, cash flow projections include the expected lending rates, typically informed by prevailing interest rates and the pool's costs, based on bond rates and any expected subsidies the pool will receive.

#### Investment Rates

Cash flows typically reflect actual investments in the pool program. Some pool programs use long-term investment agreements called guaranteed investment contracts (GIC). GICs are fixed-rate investment agreements with financial institutions, such as banks or insurance companies, that provide a predetermined rate of return on funds invested that extends over the life of the contract. GICs may be used for various transaction funds, such as debt service funds, debt service reserves, and residual funds. Where the terms of the GICs are available, cash flow projections reflect the contracted interest rates, maturity, restrictions on deposits and withdrawals, and minimum or maximum balances.

For balances in excess of amounts permitted by the GIC and all invested funds that do not have any guaranteed rate of return, the reinvestment rate assumption is based on whether the investment portfolio benefits from active management.

For pool programs with active investment management, we use a reinvestment rate assumption that starts at 0% and increases in three steps to 1.5% over 11 years, as shown in Exhibit 6. Reinvestment rate assumptions for pool programs without active investment management remain at 0% for the life of the bonds.

## EXHIBIT 6

**Reinvestment Rate Assumptions for Investments Without Any Guaranteed Rate of Return**

(Years Reflect Time Elapsed in Cash Flow Projections, Not Investment Terms)

With Active Management		Without Active Management
Years	Rate	Rate
1 – 3	0%	0%
4 – 6	0.5%	0%
7 – 10	1%	0%
11 – maturity	1.5%	0%

Source: Moody's Investors Service

**Counterparties**

Pool programs rely on performance by outside counterparties, including GIC and other investment providers, liquidity providers and swap counterparties.

We incorporate risks related to counterparty performance in our cash flow inputs by haircutting the amounts held in a GIC or other investment vehicles and by haircutting the net interest rate swap payments. The haircuts are based on the rating of the counterparty and the rating of the associated pool program (see Exhibit 7). When the GIC provider is an insurance company, we use the Insurance Financial Strength Rating as the counterparty rating. When the GIC provider is a bank, we use the bank's deposit rating as the counterparty rating. For interest rate swaps, we use the provider's Counterparty Risk (CR) Assessment as the counterparty rating.

## EXHIBIT 7

**GIC and Swap Haircuts, by Provider Rating Level\***

Provider Rating	Aaa Program	Aa Program	A Program	Baa Program
A1 or higher	0%	0%	0%	0%
A2	35%	0%	0%	0%
A3	45%	35%	0%	0%
Baa1	55%	45%	35%	0%
Baa2	65%	55%	45%	35%
Baa3	85%	65%	55%	45%
Below Baa3	100%	100%	100%	100%

\*We haircut by 100% any amounts held in a GIC or other investment vehicles and net interest rate swap payments when the counterparty is unrated.

Source: Moody's Investors Service

We use an additional stress case for pool programs that may otherwise be eligible for a rating of Aaa, where these programs have limited diversification and rely on investment earnings or swap payments to meet debt service. In these cases, if a provider is rated below A1, we run a projections scenario assuming that the provider will no longer meet its payment obligations to the pool. For pool programs that may otherwise be eligible for a rating of Aa1 to Aa3, we run a similar scenario assuming that any provider rated below A2 will no longer meet its payment obligations to the pool.

Cash flows reflect the GIC haircuts in the following ways:

- » Amounts in the debt service reserve funds are reduced by the appropriate discount. For debt service or debt service reserve funds, the one-time principal reduction is equal to the highest projected six-month fund balance, which typically varies with the prepayment assumptions.
- » The investment return for the debt service fund and the reinvestment rate for the debt service fund are calculated by applying the applicable investment rate to the discounted principal.

Where a GIC is terminated after a rating downgrade of the provider and the investment balance is returned to the pool, we do not haircut the principal amounts in the GIC, but cash flow projections reflect the reinvestment rate assumptions for investments without any guaranteed rate of return (see Exhibit 6).

Cash flows reflect the swap haircuts in the following ways:

- » Under the high interest-rate scenarios (where net swap payments are typically in the issuer's favor), cash flows reflect full fixed-rate swap payments by the pool program in exchange for full variable-rate receipts from the swap counterparty in the initial three years, followed by discounted fixed-rate swap payments in exchange for discounted variable-rate receipts through the life of the bond.
- » Under the low interest-rate scenario, pool programs continue to make full fixed-rate swap payments in exchange for full variable-rate receipts.

In cases where a pool program's rating has been downgraded to a level at which the provider can terminate the swap, we analyze cash flows using an assumption that the pool pays any swap termination amounts and that the variable-rate debt related to the swap is unhedged. However, when swaps are novated following a downgrade, cash flow projections reflect terms of the novated swaps and incorporate expenses payable by the indenture or pool program, if any.

Many investment agreements provide for the posting of collateral by an investment provider if its rating falls below a specified level. We typically do not consider that such provisions enhance the likelihood of payment of the earnings or repayment of the principal investment, because the collateral posting may be subject to the automatic stay or disgorgement provisions in the event the investment provider files for bankruptcy.

### Bond Interest Rates

For fixed-rate transactions, cash flow inputs incorporate the actual interest rates on the bonds or the anticipated interest rates when the cash flows are generated before bond pricing. For variable-rate transactions, cash flow inputs reflect both a low interest-rate scenario and a high interest-rate scenario.

#### *Low Interest-Rate Scenario*

In this scenario, the prevailing taxable short-term rate in the US starts at 0.25% and gradually increases to 2.0% over 10 years (Exhibit 8).

Interest rates for pool program variable-rate bonds may be based on the Securities Industry and Financial Markets Association's (SIFMA) municipal swap index, which comprises tax-exempt variable-rate demand obligations (VRDOs). Since the SIFMA rate does not have a forward curve, we derive the SIFMA rate input for the cash flow projections based on a percentage of the prevailing taxable short-term index in the US. VRDOs are assumed to pay interest at the SIFMA rate (with additional trading spreads outlined in Exhibit 8). Correspondingly, we incorporate a higher ratio of the SIFMA rate/prevaling short-term index to reflect compression between tax-exempt and taxable rates when interest rates are low. For pool programs that use swaps based on one-month taxable short-term index rates, the SIFMA rate/one-month taxable short-term index rate ratio stays at 105% for the initial five years and decreases to 95% thereafter.

For pool programs that use swaps based on three-month taxable short-term index rates, we assume a SIFMA rate/three-month taxable short-term index rate ratio of 80% for the life of the VRDOs.

### *High Interest-Rate Scenario*

In the standard high interest-rate scenario, the prevailing taxable short-term index rate starts at the current level, increases to 10.5% over five years, remains at 10.5% for an additional five years and decreases to a holding rate of 8.25% thereafter.<sup>25</sup>

EXHIBIT 8

### **Interest Rate Assumptions for Pool Programs with Variable-Rate Debt**

		Low Interest-Rate Environment		High Interest-Rate Environment	
Prevailing Taxable Short-term Index Rates		Year 1-3	0.25%	Year 1-5	Ramp up from current to 10.5%
		Year 4-6	0.75	Year 6-10	Hold at 10.5%
		Year 7-10	1.50%	Year 11-17	Wind down to 8.25%
		Thereafter	2.00%	Thereafter	Hold at 8.25%
Ratio of the SIFMA Rate /Taxable Short-term Index Rate	1-month taxable short-term index rate	Year 1-6	105% of 1-month taxable short-term index rate	75% of 1-month taxable short-term index rate	
		Thereafter	95% of 1-month taxable short-term index rate		
	3-month taxable short-term index rate	80% of 3-month taxable short-term index rate		75% of 3-month taxable short-term index rate	

Source: Moody's Investors Service

### **VRDO Spread Levels**

The VRDO interest rate assumptions for variable-rate debt are based on historical taxable short-term index rate data. We assume that the tax-exempt bonds pay a rate equal to the SIFMA rate plus a spread, where the SIFMA rate is equal to certain percentages of the taxable short-term index rate, as shown in Exhibit 8. The trading spreads are described below.

<sup>25</sup> We would vary these assumptions in a high interest-rate environment, and the assumed taxable rate would in all cases be at least as high as the 10-year sovereign bond yield plus 3%.

Our spread assumptions for VRDOs not subject to alternative minimum tax (AMT) is five basis points. For AMT and taxable VRDOs, our spread assumptions are 15 basis points and 40 basis points, respectively. We consider using different assumptions if a pool program provides historical evidence of narrower spreads by tax status on its VRDOs.

In addition, for the initial year, an additional 30-basis-point spread is assumed for VRDOs supported by the largest private-sector liquidity provider (Exhibit 9) to reflect a stress scenario due to a weak credit market.

## EXHIBIT 9

**VRDO Spreads for Pool Programs with Variable-Rate Debt**

<b>Tax Status</b>	<b>Time Period</b>	<b>Remaining Providers</b>	<b>Largest Private Sector Standby Bond Purchase Agreement Provider</b>
Non-AMT	First Year	5 bps	35 bps
	Thereafter	5 bps	5 bps
AMT	First Year	15 bps	45 bps
	Thereafter	15 bps	15 bps
Taxable	First Year	40 bps	70 bps
	Thereafter	40 bps	40 bps

Source: Moody's Investors Service

**Liquidity Facilities Renewal Expense**

We assume that the cost of maintaining a liquidity facility for a pool program that has issued VRDOs increases at the first stated expiration date of the facility to the greater of (i) our estimate of current market rates for such facilities; (ii) an all-in cost of 100 basis points per year; or (iii) 20% above the current annual cost of the existing facility.

**Net Effect of Swaps**

Pool program cash flows reflect the effect of interest rate swaps where a pool program uses them to hedge its variable-rate debt. There are three relevant payment streams:

- » The pool program's variable-rate debt service payments.
- » The pool program's fixed payments to the swap counterparty based on the rate in the swap documents (or the expected rate, in the case of pre-pricing cash flows).
- » The counterparty's variable-rate payments to the pool program based on the terms of the swap and the high and low interest-rate scenarios.

Cash flows may reflect the three separate payment streams or one net payment stream, but the net effect remains the same in either scenario. Depending on the interest rate environment, the net effect of an interest rate swap could be an outflow or an inflow to the pool program.

**Bank Bonds**

For pool programs with VRDOs using external liquidity facilities, cash flow projections include additional scenarios to test the ability of the pool program to meet its debt service obligations if a failed remarketing were to result in bank bonds, which typically have accelerated repayment schedules

and high interest rates. The cash flow projections include additional scenarios that test the ability of the pool program to withstand (i) a period of high interest-rate spreads on variable-rate debt (other than indexed bonds); and (ii) repayment of bank bonds for one year (before the bonds can be re-marketed as VRDOs).

We review scenarios under the high and low interest-rate environment assumptions described above, modified by the bank bond repayment assumptions below. We also assume minimum prepayment for both scenarios.

For the bank bond projection scenarios, we assume the amount of bank bonds will be equal to the highest of (i) 25% of the VRDOs; (ii) the amount of bonds supported by the liquidity provider with the highest percentage of exposure in the program; or (iii) the current amount of bank bonds. Bank bond cash flow projections assume a higher amount of bank bonds where particular circumstances warrant, such as where the ratings for relevant liquidity banks are downgraded or the relevant liquidity banks are not supporting remarketings effectively. In these cases, VRDOs supported by these banks would be considered bank bonds in the cash flow projections.

Where a pool program has bank bonds that require accelerated repayment, the cash flow projections assume the schedule of bank bond interest and principal repayment based on the terms of the liquidity agreement. Where a pool program does not have any bank bonds, we assume that the bank bond amount determined in accordance with the previous paragraph becomes bank bonds on the first day of the cash flow projections, with repayment based on the terms of the liquidity agreement. The cash flow projections assume that the pool program makes these payments for one full year (i.e., the bank bond period). At the end of the bank bond period, cash flow projections assume that the remaining balance of the bonds are remarketed and remain VRDOs supported by the same liquidity facility (subject to increased cost upon the facility's expiration).

Bank bond cash flow projections assume the following:

- » The pool program pays the full amount of the bank bond amortization in accordance with the terms of applicable conditional liquidity support for the amount of bonds assumed to become bank bonds.
- » If the largest conditional liquidity provider's exposure covers less than 25% of the VRDOs (and we therefore assume the amount of bank bonds is equal to 25% of the total VRDOs issued by the pool program), we use the bank bond repayment schedule associated with the liquidity provider with repayment terms that would result in the largest amount of bank bond repayments during the one-year term.
- » The bank bonds bear interest at the bank rate, calculated as prescribed in the pool program's liquidity support contract, including any step-ups during the first 12 months.
- » Where the bank rate is based on the prime rate, our prime rate assumption is 95% of the prevailing taxable short-term index rate plus 300 basis points.

Cash flow projections incorporate either (i) full ongoing payments on the swaps associated with the bank bonds even after the bank bonds have been redeemed (unless par termination options are available to the pool program); or (ii) swaps terminate at market value plus associated fees.

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