

RATING METHODOLOGY

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Public Pension Managers Methodology

Introduction

In this rating methodology, we explain our general approach to assessing credit risk for public pension managers globally, including the qualitative and quantitative factors that are likely to affect rating outcomes in this sector.

We discuss the Baseline Credit Assessment¹ (BCA) scorecard used for this sector. The BCA scorecard² is a relatively simple reference tool that can be used in most cases, together with our Joint Default Analysis (JDA) and our framework for assessing priority of claim, to approximate credit profiles in this sector and to explain, in summary form, many of the factors that are generally most important in assigning BCAs to issuers in this sector. The scorecard factors may be evaluated using historical or forward-looking data or both.

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 the issuers in the sector or because the factor may be important only under certain circumstances 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 BCAs and ratings in this sector. Furthermore, 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 BCA for each issuer.

Our presentation of this rating methodology proceeds with (i) the scope of this methodology; (ii) an overview of the sector and our overall approach to rating public pension managers based on a BCA; (iii) the scorecard framework; (iv) a discussion of the scorecard factors; (v) constraints on Baseline Credit Assessments; (vi) other rating considerations not reflected in the scorecard; (vii) assigning a Baseline Credit Assessment, (viii) assessing the impact of affiliate and government support, (ix) the assignment of issuer-level and instrument-level ratings, (x) methodology assumptions; and (xi) limitations. In Appendix A, we describe how we use the scorecard to arrive at a scorecard-indicated outcome. Appendix B shows the full view of the scorecard factors, sub-factors, weights and thresholds. Appendix C describes the haircuts we apply to investments for the calculation of the liquidity ratio as well as the recognition rates we use for off-balance-sheet items.

¹ For information about Baseline Credit Assessments, please see Rating Symbols and Definitions. A link to this publication can be found in the "Moody's Related Publications" section.

² In our methodologies and research, the terms "scorecard" and "grid" are used interchangeably.

Scope of This Methodology

This methodology applies to public pension managers globally.³ Public pension managers include public pension funds, which are responsible for administering plan contributions and benefits as well as investment management, and public pension reserve funds, which are responsible for investment management but are not responsible for administering plan contributions and benefits. Public pension managers invest on behalf of a sovereign or sub-sovereign government, including states, provinces and local governments, with the express purpose of providing future retirement or other investment-related benefits to plan beneficiaries directly (in the case of public pension funds) or to other public entities (in the case of public pension reserve funds).

Public pension managers are government-related issuers (GRIs), and this methodology is used in cases where we have sufficient information to assign a BCA. In our methodology that discussed GRIs,⁴ we describe our approach to rating public pension managers in cases where we do not have sufficient information to assign a BCA, and the rating is primarily based on government support.

Sector Overview and Overview of the Overall Rating Approach

The primary purpose of public pension managers is to manage invested assets in order to meet a pension funding obligation. Public pension managers typically have a largely captive contribution base, and their pension benefit liabilities are typically paid out over very long periods of time. The intrinsic strength/weakness of a pension manager depends principally on its ability to invest in a manner such that assets under its stewardship will be sufficient to meet future pension obligations. Typically, this means investing with a very long-term horizon. Public pension funds also directly manage risks stemming from the obligation to provide recurring benefit payments to retirees. A public pension reserve fund manages funds on behalf of the government entity that is its sponsor and client rather than the ultimate beneficiaries, and the sponsor retains responsibility for benefit payments.⁵ Nonetheless, whether that benefit obligation resides with the public pension manager or the sponsor, there is no difference in the sponsor's expectation that the public pension manager will manage invested assets successfully or prudently. Some public pension managers incur debt and debt-like obligations (e.g., guarantees, obligations under derivatives agreements), typically in order to boost investment returns.

The assets of public pension managers rarely exceed the pension benefit obligations; when plans are overfunded, contributions are likely to be reduced. Many public pension plans are underfunded, which implies that the sponsors' future contributions will have to be higher than historical contributions in order for the pension plan to meet its future obligations. In these cases, pension managers may decide to invest more aggressively, increasing the risk profile of the fund.

In comparison to some other financial institutions, public pension managers are not highly exposed to maturity transformation risks and are usually not susceptible to confidence events that would cause a rapid acceleration in the payment of pension benefits. Nonetheless, a poor liquidity profile, low funding levels and negative non-investment cash flow may require forced asset sales at inopportune times that can threaten

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.

³ For clarity, this methodology describes how we assess risk for a public pension manager's creditors and assign ratings to the debt and debt-like obligations of a public pension manager; we do not assign ratings to a public pension manager's pension funding obligation.

⁴ A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

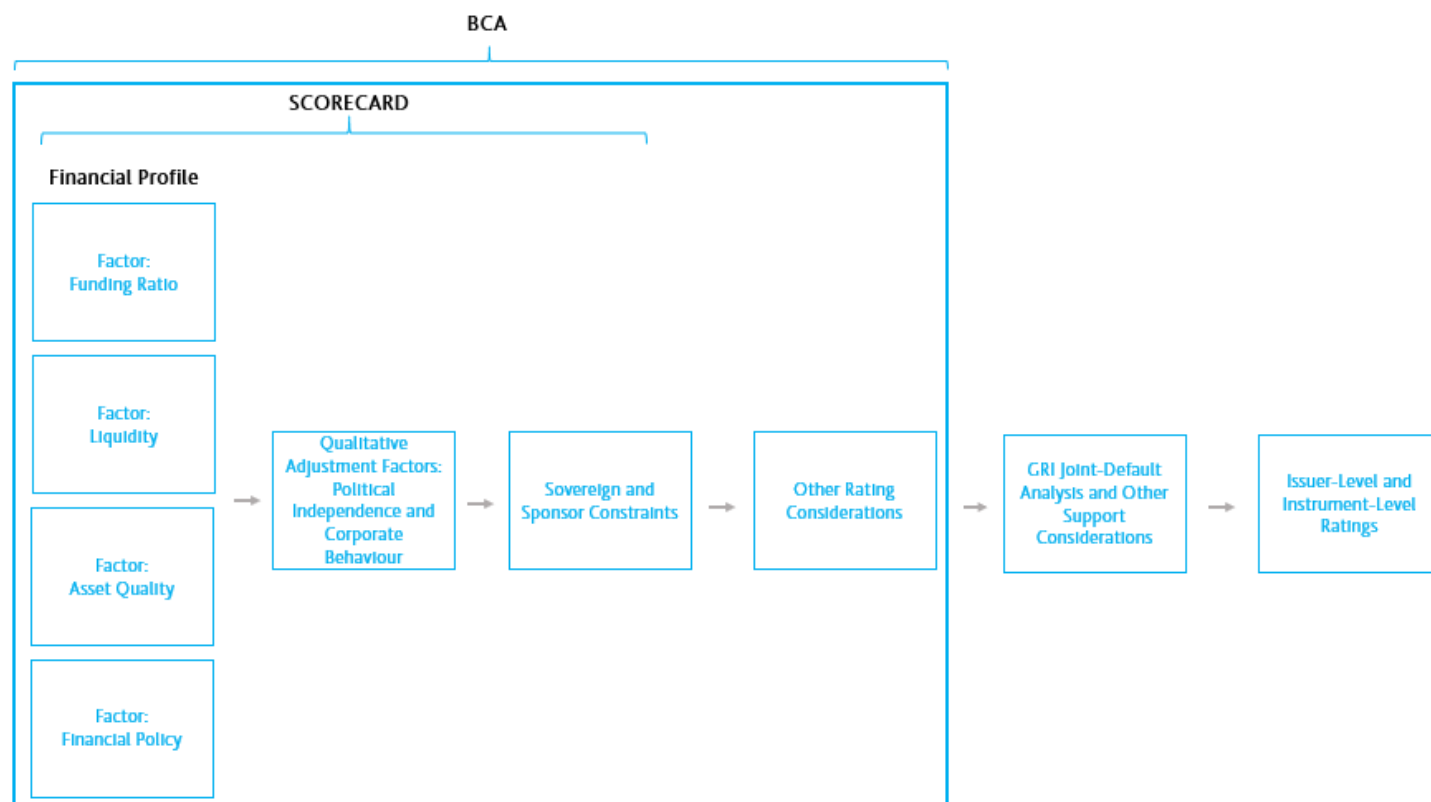
⁵ In addition to managing pension assets, many public pension reserve funds manage assets on behalf of other public investment programs, such as a debt sinking fund or an auto or workers' compensation insurance program. A public pension reserve fund may also manage only a portion of a sponsor's assets, e.g., only assets associated with the pension plan of workers who were employed after a certain date.

solvency. A portfolio too highly weighted in illiquid assets reduces a pension manager's ability to quickly sell its holdings to make benefit payments to retirees and meet other financial obligations as they become due.

The overall approach for public pension managers includes a scorecard that captures the factors that are generally most important for assessing a public pension manager's stand-alone intrinsic strength, absent any extraordinary support from an affiliate or a government, including its solvency, as indicated by its ability to pay future pension-related obligations; liquidity, i.e., its capacity to meet short-term obligations without incurring forced investment losses; the quality of its assets; and its financial policy. We incorporate other considerations that may be relevant to a particular public pension manager and arrive at a BCA. In assessing government or affiliate support, we apply our JDA framework, which is described in our methodology for government-related issuers, and incorporate considerations that are specific to the public pension manager and its relationship with the government sponsor. In assigning issuer and instrument-level ratings, we consider elements that would materially affect recovery rates for creditors upon default. Our overall approach is illustrated in Exhibit 1.

EXHIBIT 1

Overall Approach to Rating Public Pension Managers Based on a BCA



Source: Moody's Investors Service

Scorecard Framework

The scorecard in this rating methodology comprises three components. The Financial Profile component has four weighted factors that result in a Financial Profile Score. The Qualitative Notching Factors component has two notching factors that may result in upward or downward adjustments in whole notch increments to the Financial Profile Score. In addition, the scorecard comprises two qualitative factors that may constrain the scorecard-indicated outcome. An example of a public pension manager scorecard is shown in Exhibit 2.

The scorecard-indicated outcome is an alphanumeric score expressed on our 21-point rating scale and is oriented to the pension manager's BCA.

EXHIBIT 2

Example of a Public Pension Manager BCA Scorecard

	Historical			Assigned		
	Factor Weights	Historic Ratio	Initial Score	Assigned Score	Key driver #1	Key driver #2
Funding Ratio*	60%	65.0%	ba2	ba2		
Net Assets / PBO						
Liquidity						
Liquidity Inflows / Outflows	13%	205.0%	aaa	aaa		
Asset Quality						
High Risk Assets / Gross Assets	13%	65.0%	baa2	a3	Expected Trend	
Financial Policy						
Financial Policy	13%	baa	baa	a	Expected Trend	
Financial Profile Outcome	100%		baa3	baa2		
Qualitative Notching				0		
Political Independence				0		
Corporate Behavior				baa2		
Scorecard-Indicated Outcome Before Constraint						
Consideration of:				No	Comment	
Sovereign Constraint				A3		
				No		
Sponsor Constraint				Aaa		
Scorecard-Indicated Outcome				baa2		

*The scorecard weights vary based on the Funding Ratio factor score. In this exhibit, the presentation of the weights is rounded to the nearest integer.

Source: Moody's Investors Service

Please see Appendix A for general information relating to how we use the scorecard and for a discussion of scorecard mechanics. The scorecard does not include every consideration.⁶

Discussion of the Scorecard Factors

The Financial Profile component of the scorecard has four weighted factors. In this section, we explain our general approach for scoring each scorecard factor, and we describe why they are meaningful as credit indicators.

To arrive at the Financial Profile Score, we apply variable weights to the four factors based on the score for the Funding Ratio factor (see next section). The lower the Funding Ratio factor score, the greater the weight assigned to this factor, because pension managers whose funding ratio is weak are more likely to face

⁶ Please see the "Other Assessment Considerations" and "Limitations" sections.

increasing financial stress. The remaining weight is equally distributed among the other three factor scores (see Exhibit 3).

EXHIBIT 3

Combining Factors Using Variable Weights

Funding Ratio Score	Funding Ratio Factor Weight	Other Factors Aggregate Weight*
aaa	40%	60%
aa	45%	55%
a	50%	50%
baa	55%	45%
ba	60%	40%
b	70%	30%
caa	70%	30%

*The other three factors are Liquidity, Asset Quality, Financial Profile.

Source: Moody's Investors Service

Factor: Funding Ratio

Why It Matters

The funding ratio, which is the ratio of net assets to the pension benefit obligation, is an important indicator of a public pension system's solvency. As funding levels fall, the probability of losses for a pension manager's creditors rises because the sponsor of a public pension system may have political difficulty imposing losses on a large group of public service pension members (for example, teachers or military members) over institutional investors that are creditors of a pension manager, irrespective of any legislative protections for creditors of a public pension system that may exist. In some municipal bankruptcies where pension claims and creditor claims were pari passu, bondholders faced higher loss rates than pensioners. Even in cases where pension system creditors benefit from priority of claim, funding levels are important because, in an insolvency scenario of the public pension manager, there will inevitably be political pressure to preserve pension benefits for public employees and to limit negative impacts on taxpayers.

Our scoring of this factor for a public pension reserve fund differs because these entities typically have a less direct relationship to the pension benefit obligation, as described above in the "Sector Overview."

How We Assess It for the Scorecard

The numerator is net assets, and the denominator is the total pension benefit obligation, based on our standard discount rate adjustments. The total pension liability is the actuarially accrued liability, often called the projected benefit obligation for accounting and actuarial funding purposes.

The funding position is calculated or estimated as the ratio of net assets to the projected benefit obligation (PBO). The numerator is net assets calculated as total assets minus debt and debt-like obligations. The denominator is PBO, which we calculate as the present value of accrued benefits, using a discount rate based on market interest rates for high-grade, taxable securities similar in duration to pension benefits.⁷ For US and Canadian pension managers, we use the FTSE Pension Liability Index (FTSE PLI).⁸ This approach yields a point-in-time liability measurement of the market value of pension promises that is comparable across reporting entities for the purpose of balance sheet analysis.

⁷ For more details, please see our methodology that describes adjustments to US State and local government reported pension data. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

⁸ The actual index used could change, for example if the FTSE PLI were no longer available. In the event the index used for US pension funds changes, it is likely that we would use the same index for Canadian pension funds. For funds outside of the US and Canada, we would use a publicly available, representative index.

For pension managers that manage only pension assets (reserve funds), we typically consider that the pension plan is fully funded because, in contrast to a public pension plan, the underlying obligation is to its respective sponsor, not the ultimate beneficiary. We thus assign an initial score to the funding ratio corresponding to a fully funded plan (i.e., aaa).

FACTOR

Funding Ratio

Factor	Factor Weight	aaa	aa	a	baa	ba	b	caa	ca
Net Assets / PBO (%)	Variable	≥ 100	90 - 100	80 - 90	70 - 80	60 - 70	50 - 60	40 - 50	< 40

Source: Moody's Investors Service

Factor Adjustments

Please see the "Measurement or Estimation of Factors in the Scorecard" section in Appendix A for a general description of how we apply adjustments. Typical considerations that may lead to adjustments to the Funding Ratio factor score include the following:

- » **Benefit and contribution flexibility.** We would consider a downward adjustment if there are legislative or regulatory barriers to even modest changes in benefits or if we estimate that the sponsor's future contribution levels are likely to produce falling funding levels. Conversely, we would consider an upward adjustment if we have reasons to be confident that future funding levels will increase due to benefit and/or contribution changes.
- » **Disclosure of funding status.** We consider the level of complexity and opacity in the determination of the funded status of pension underlying obligations. Some pension managers may oversee multiple obligations that may or may not be pension-related. For example, a pension reserve fund may have sponsor-specific obligations embedded within its mandate, such as a debt retirement sinking fund or investments related to a government-owned organization. To the extent we have limited visibility on the related liabilities arising from these obligations, including potential contingent cash flows, we may assign a lower factor score.
- » **Additional information regarding sponsor's funding status.** In cases where a plan is consistently fully funded based on independent, actuarially based calculations, using assumptions we view as appropriately conservative, the assigned factor score may be higher than the initial score. For reserve funds, while the initial score is usually aaa, the assigned score typically incorporates our view of the plan's funding ratio if we were to calculate Net Assets / PBO including our estimate of the portion of the sponsor's projected benefit obligation that the reserve fund we believe will be expected to meet. Thus, the assigned score may be lower than the initial score.

Factor: Liquidity**Why It Matters**

Liquidity is an important indicator of a pension manager's ability to meet its short-term obligations, including counterparty liabilities, such as calls related to derivatives and short-selling, benefit payments to retirees and debt payments, such as commercial paper and the current (maturing) portion of long-term debt instruments.

A sufficient stock of high-quality liquid assets enables a pension manager to meet expected and unexpected obligations when they come due; in both normal and stressed market conditions. Insufficient liquidity, particularly during a market stress or in a scenario where benefit outflows significantly exceed incoming

contributions, can result in forced asset sales at a time of diminished market value, leading to a rapid deterioration of a manager's solvency position.

This metric used to assess liquidity provides an important indication of a pension manager's level of preparedness to withstand a liquidity shock. The higher the liquidity ratio, the better the pension manager is prepared to withstand a liquidity shock. Conversely, the lower the ratio, the more of a challenge it might face in addressing such a shock (absent liquidating invested assets or extraordinary external support).

How We Assess It for the Scorecard

The ratio assesses liquidity inflows (including certain balance sheet resources) and outflows in a scenario where all of the pension manager's funding sources, except its long-term debt and equity investments, sponsor commitments and committed credit facilities, become unavailable or are withdrawn, and where the pension manager becomes exposed to its off-balance-sheet commitments and contingencies, in addition to normal outflows. We compare the size of the pension manager's outflows under this scenario to the combined value of its securities and investments portfolio, after applying a set of standard haircuts to reflect loss of value in a stress scenario, and the amount of available funding from undrawn, committed credit facilities that will remain available over the year.

Liquidity inflows (the ratio numerator) is the sum of inflows defined as unrestricted cash, amounts due from other financial institutions, securities and investment portfolio balances (net of standard haircuts detailed in Appendix C), cash inflows from operating assets (including contributions from membership and sponsors), available funding from undrawn and committed funding facilities. For calculation of this ratio, we include only committed credit facilities from highly rated financial institutions where availability will be in place for at least a year and will not be constrained, e.g., no requirement to represent a lack of material adverse change or material adverse liabilities in order to draw, no financial covenants that would be likely to constrain drawdown, and no onerous collateral posting requirements.

Liquidity outflows (the ratio denominator) is the sum of repos, securities lending obligations, trading liabilities, short-term borrowings, other financial liabilities through profit or loss, other amounts due to other institutions, cash outflows from operating liabilities (including benefit payments and administration and investment expenses), payables, and commitments and contingencies based on standard recognition rates (see Appendix C). It may also include an assumption of an increase in pension benefit outflows in such cases where employees or retirees can potentially withdraw pension assets such as optional benefit plans.

The point-in-time ratio is calculated based on a one-year period starting from the opening balance sheet position in the pension manager's most recent annual financial statements.

FACTOR

Liquidity

Factor	Factor Weight	aaa	aa	a	baa	ba	b	caa	ca
Liquidity Inflows / Outflows (%)	Variable*	≥ 200	160 - 200	130 - 160	110 - 130	90 - 110	70 - 90	40 - 70	< 40

*The scorecard weights vary based on the Funding Ratio factor score. See the "Discussion of the Scorecard Factors" section above for more details.

Source: Moody's Investors Service

Factor Adjustments

Please see the "Measurement or Estimation of Factors in the Scorecard" section in Appendix A for a general description of how adjustments are employed in the scorecard. Typical considerations that may lead to adjustments for the Liquidity factor score include:

- » **Significant concentration, highly volatile securities, and other sources of heightened investment risk.** We may adjust the initial liquidity factor score downward if we consider that the portfolio has heightened risk, for example, holdings of the sovereign debt, corporate debt and equities of a developing country, in order to reflect the higher price volatility risk in such securities that may not be fully reflected in our standard haircut rates. We may also adjust the liquidity score due to other concentrations, large exposure to highly volatile securities, or risks introduced under financing arrangements. Indicators of heightened risk may include:
 - Concentrated position in a single security or group of securities that represents a significant part of the total market for such security or group of securities.
 - Concentration in a single asset type or small group of asset types.
 - Concentration of transactions with a single counterparty or small group of counterparties.
 - Significant maturity mismatches.
 - Utilization of higher-risk securities in repurchase agreements and/or securities borrowing and lending arrangements.
 - Excessive or unusual asset encumbrance.
 - Reliance on concentrated non-central clearing (bilateral) short-term financing arrangements.
 - Concentrated dependence on prime broker(s), with a consequent limited ability to ward off demands for significantly increased collateral postings that could adversely affect the liquidity profile.
- » **Concerns with validity of fair value hierarchy reporting.** We may adjust the initial liquidity score downward for pension managers whose financial reporting is prepared using "local GAAP" (i.e., not IFRS or US GAAP, or if the local interpretation of IFRS or US GAAP may not be in compliance with international norms) in cases where we consider that the reported fair value hierarchy classification of securities and investments is not consistent with IFRS/US GAAP norms. In such cases, we typically reallocate the classification of each type of security and investment in the fair value hierarchy using our analytical judgment based on available information, and we update the ratio haircut calculations based on the adjusted classifications. The resultant adjusted liquidity ratio typically informs any downward factor adjustment.
- » **Lower risk in securities and investments portfolio.** We may adjust the initial liquidity score upward (and also the Asset Quality factor score – see below) if we consider that the portfolio has lower risk. Indicators of lower risk may include holding a significantly larger portion of assets, relative to peers, in broadly diversified, high quality, investment-grade debt securities.
- » **Liquidity inflows and outflows trend.** We may adjust the Liquidity factor score upward or downward to reflect important trends in this ratio that we believe are not fully captured in the initial score. We would typically consider the potential for the trend to accelerate, decelerate, or reverse.
- » **Lawsuits and similar contingent liabilities.** We may adjust the Liquidity factor score downward to reflect important changes in the liquidity profile that would occur if the public pension manager were to receive an adverse legal judgment or were required to pay a large fine. Typically, these adjustments would be rare and related to ongoing disputes or proceedings with a considerable likelihood that payment would be required.

Factor: Asset Quality

Why It Matters

Asset quality is an important indicator of the stability of the investment portfolio over time and the pension manager's ability to meet future obligations to its creditors and pension plan constituents.

Due to their longer investment horizons, pension managers are typically able to hold a higher quantity of long-duration, riskier and more volatile assets than many other types of financial institutions. Nonetheless, a pension manager whose portfolio is more heavily weighted toward equities, direct investments (e.g., real estate), unconventional holdings and other illiquid investments is more exposed to asset volatility than a pension manager whose holdings are primarily high quality, fixed-income investments. A portfolio with high volatility or concentrated or outsized positions can cause financial stress and a loss of creditor confidence, thereby increasing risk to creditors and the potential need for extraordinary support from the sponsor to preserve the pension manager's viability.

Diversification of the investment portfolio across asset classes and geographies typically helps to dampen potential volatility of future investment returns. Diverse portfolios are typically better able to mitigate the inflation risk associated with the long-duration liabilities typical to pension obligations.

How We Assess It for the Scorecard

The numerator is high risk assets, and the denominator is gross assets.

High-risk assets broadly comprise all investments other than investment-grade bonds and mortgage loans, including below-investment-grade and unrated bonds/loans, common and preferred stock equities, alternative investments such as private equity and hedge fund holdings, real estate assets, and other investments that are not classified on a pension manager's balance sheet.

FACTOR

Asset Quality

Factor	Factor Weight	aaa	aa	a	baa	ba	b	caa	ca
High Risk Assets / Gross Assets (%)	Variable*	≤ 30	30 - 40	40 - 55	55 - 70	70 - 80	80 - 90	90 - 95	> 95

*The scorecard weights vary based on the Funding Ratio factor score.

Source: Moody's Investors Service

Factor Adjustments

Please see the "Measurement or Estimation of Factors in the Scorecard" section in Appendix A for a general description of how adjustments are employed in the scorecard. Typical considerations that may lead to adjustments for the asset quality factor score include:

- » **Asset class and geographic diversification:** Excessive concentrations in a single name or sector increase asset risk and raise questions about market and credit risk management, the sustainability of historical investment returns and the sufficiency of those returns over time. We may adjust the Asset Quality factor score upward or downward if we consider that the portfolio has heightened diversification or concentration, respectively.
- » **Level 3 assets:** We may adjust the Asset Quality factor score downward if the investment portfolio has a large amount of Level 3 (mark-to-model) assets. In some jurisdictions, fair-value

accounted assets are divided into categories depending on how they are valued. "Level 3" assets are those that are valued in accordance with a model rather than by a reference to traded instruments. The value of these assets is subject to a higher level of uncertainty than others due to reliance on models and economic assumptions rather than market-observable inputs.

- » **Operational risk.** Operational risks can lead to losses that reduce a pension manager's investment returns, or worse, reduce the value of its investments in a manner that would adversely impact its ability to pay creditors and benefit obligations. We may adjust the Asset Quality factor score downward in cases where we consider a pension manager has heightened operational risk, for example where the manager's capabilities are challenged as it handles multiple pension plans with different, complex requirements or where there are material systems weaknesses or the manager is undergoing significant systems changes. Public pension funds typically have greater operational risk than pension reserve funds because they are responsible for contribution and benefit administration in addition to managing a portfolio of assets.
- » **Asset correlation.** Asset correlation can occur when the pension manager's investments are partially or wholly dependent on the performance or direction of the sponsor. Specifically, a pension manager's ability to manage risk through investment diversification can be diminished if its portfolio includes a material amount of the sponsor's debt or if the investment portfolio has a high concentration in the local jurisdiction of the manager. We may adjust the Asset Quality factor score downward in cases where we consider that correlation risk is material, and the downward notching is typically greater as correlation increases or as the sponsor's credit quality weakens.
- » **Foreign exchange risk.** Foreign exchange risk arises where there are currency mismatches, for example, mismatches between the currencies of the pension manager's investment portfolio and the currencies of its creditor obligations or pension benefit obligation. Additionally, there can be mismatches between the currencies in which the pension manager earns income and those in which it pays expenses. We may adjust the Asset Quality factor score downward in cases where the amount of unhedged foreign exchange risk is material relative to the pension manager's assets, revenues or expenses.
- » **Asset quality trend.** We may adjust the Asset Quality factor score upward or downward to reflect important trends in this ratio that we believe are not fully captured in the initial score. We would typically also consider the potential for the trend to improve or deteriorate.

Factor: Financial Policy

Why It Matters

Management and governing board tolerance for financial risk is an important assessment factor as it directly affects debt levels, investment portfolio credit quality and risk in the financing structure (e.g., refinancing risk, counterparty risk or exposure to interest rates or foreign exchange movements).

Financial risk tolerance serves as a guidepost to investment and capital allocation. An expectation that management will be committed to sustaining an improved credit profile is often necessary to support an upgrade. We may not consider a higher credit assessment for a pension manager if we believe it will soon increase leverage or investment in riskier assets. Conversely, a pension manager's credit rating may be better able to withstand a near-term increase in leverage if we expect management to return leverage to historically normalized levels and it has consistently demonstrated the commitment to do so through prior

actions. Liquidity management⁹ is an important aspect of overall risk management and can provide insight into risk tolerance.

How We Assess It for the Scorecard

In scoring this qualitative factor, we typically assess the issuer's desired capital structure or targeted credit profile, its history of prior actions, including its track record of risk and liquidity management, and its adherence to its commitments. Attention is paid to management's operating performance and use of cash flow and leverage through different phases of economic cycles. We also consider the way management responds to key events, such as changes in the credit markets and liquidity environment, policy and legal actions or regulatory or political pressures.

Our assessment may be informed by quantitative analysis, such as trends in historical or projected leverage. However, for our qualitative assessment of financial policy, these indicators are not considered in isolation; instead, they are considered together with other indicators of the public pension manager's tolerance for risk. For example, we typically consider both the purpose of leverage as well as the amount of leverage, both financial (borrowed funds) and synthetic (using derivatives). We typically view leverage strategies that are designed to diversify funding sources or to help reduce volatility in the funding ratio (e.g., liability-driven investment strategies) as positive. This would include strategies that enhance asset-liability management, for example, by using leverage to increase exposure to fixed income assets. We also assess the impact of taking on leverage, which often results in transforming one risk into another. While a leverage strategy can result in better asset-liability management, it gives rise to other risks, such as liquidity, counterparty and refinancing risks.

In scoring this factor, we consider the overall quality of a public pension manager's risk management strategy, including the procedures and controls in place for managing associated risks. This is particularly important in our assessment of synthetic leverage, for which little disclosure is available.

We also consider a manager's public commitments in this area, its track record for adhering to commitments and our views on the ability of the fund to achieve its targets.

⁹ Liquidity management is distinct from the level of liquidity, which is assessed under the Liquidity factor, although an issuer's overall liquidity management typically affects our view of the trend in liquidity.

FACTOR

Financial Policy

Factor	Factor Weight	aaa	aa	a	baa	ba	b	caa	ca
Financial Policy	Variable*	Expected to have extremely conservative financial policies, including risk and liquidity management, with no or very limited usage of leverage; absence of refinancing and counterparty risks; no exposure to interest rates or foreign exchange movements and very conservative discount rate assumptions; very stable metrics; and public commitment to a very strong credit profile over the long term.	Expected to have very conservative financial policies, including risk and liquidity management, with limited usage of leverage but almost no refinancing and counterparty risks; negligible exposure to interest rates or foreign exchange movements and conservative discount rate assumptions; stable metrics; and public commitment to a strong credit profile over the long term.	Expected to have predictable financial policies that preserve creditor interests, including risk and liquidity management, with moderate usage of leverage but limited refinancing and counterparty risks; limited exposure to interest rates or foreign exchange movements and discount rate assumptions in line with industry standards; strong commitment to a solid credit profile.	Expected to have financial policies that carry some risks for creditors, including risk and liquidity management with meaningful use of leverage or with moderate refinancing or counterparty risks, or exposure to interest rates or foreign exchange movements could have a moderate impact on metrics; or discount rate assumptions are somewhat above average industry standards.	Expected to have financial policies that carry meaningful risk for creditors, including risk and liquidity management, with large use of leverage or large refinancing or counterparty risks; or exposure to interest rates or foreign exchange rate movements could have a substantial impact on metrics; or discount rate assumptions are substantially above average industry standards.	Expected to have financial policies that carry elevated risk for creditors, including risk and liquidity management, with very large leverage or very large refinancing or counterparty risks; or exposure to interest rates or foreign exchange rate movements could have a high impact on the metrics; or discount rate assumptions are very substantially above industry standards.	Expected to have financial policies that carry a very elevated risk for creditors, including risk and liquidity management, with extremely large use of leverage or extremely large refinancing or counterparty risks; or exposure to interest rates or foreign exchange rate movements could lead to a severe impact on the metrics; or discount rate assumptions are unrealistic.	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring even in healthy economic environments.

*The scorecard weights vary based on the Funding Ratio factor score.

Source: Moody's Investors Service

Qualitative Notching Factors

The scorecard includes notching factors. Our qualitative assessment of these factors may result in upward or downward adjustments to the Financial Profile Score that results from the Funding Ratio, Liquidity, Asset Quality and Financial Policy factors. Adjustments may be made in whole 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 six downward notches from the Financial Profile Score. 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 notching range, we incorporate this view into the issuer's BCA, which may be different from the scorecard-indicated outcome.

This component comprises two notching factors.

Qualitative Notching Factor	Notching Range
Political Independence	+1 to -3
Corporate Behavior	+1 to -3
Total Notching Adjustments	+2 to -6

Source: Moody's Investors Service

Political Independence

Why It Matters

Political interference in the investment decision process could result in sub-optimal investment results that affect the funding ratio. Formal and informal mandates to make investments that contribute to local economies could result in pressure to invest in politically sensitive projects that do not provide a reasonable risk-return trade-off or have little chance of commercial viability. In addition, political interference in setting PBO assumptions or goals, such as the discount rate or target return rate, can affect the risk profile and financial health of pension managers. The extent to which management is appointed by elected officials rather than an independent board can affect the quality of the fund's investment decisions, financial policies and risk management.

How We Assess It for the Scorecard

In assessing political independence, we typically assess the extent to which elected officials or political appointees direct or negatively influence: the public pension manager's investment policies, procedures or decisions; its target returns, discount rate, or valuation assumptions; its financial policies and risk management; or its ability to invest in appropriate systems and personnel to fulfill its mandate. We may make a downward adjustment for political independence, typically by one notch, but occasionally by up to three when political interference is severe. We may also adjust upward when there are extraordinary protections (e.g., special constitutional protections) that protect the public pension manager's independence from the executive branch and decisions by a standard legislative process.

Corporate Behavior

Why It Matters

A pension manager's creditworthiness can be influenced by its corporate governance, and poor governance can signal other concerns. Key considerations are: strategy and management, key-person risk, financial policies, accounting policies, track record under stress situation, etc.

How We Assess It for the Scorecard

In assessing corporate behavior, we consider a number of factors, as follows:

- » **Key-person risk.** A pension manager's high dependence on a single executive or group of executives can pose increased risks, because the loss of a single person could adversely affect the pension manager's future fundamentals.
- » **Strategy and management.** A radical departure in strategy, a shake-up in management or an untested team can herald sudden change that increases uncertainty about a pension manager's risk profile. An aggressive investment plan can also signal an elevated risk appetite, while clear weaknesses in risk management can increase a pension manager's exposure to adverse developments. Any concerns regarding the rigor of board or management oversight may also be considered in this factor.

- » **Compensation policy.** An aggressive compensation policy, for example, widespread use of high bonus payments relative to salaries, especially when skewed toward immediate, irrevocable cash payouts, may encourage short-term risk-taking behavior to the detriment of a pension manager's creditors.
- » **Accounting policies.** Some pension managers, although subject to more demanding accounting standards (e.g., US GAAP or IFRS) may choose to adopt aggressive accounting policies. This can sometimes be a strong indication of issues with corporate culture and compliance practices that could be detrimental to creditors' interests. Accounting restatements also raise questions about the efficiency of accounting controls and, hence, the accuracy of financial ratios. For instance, if a pension manager is required to restate its earnings, consequences can include a loss of confidence in management and the institution, including the public pension manager's funding counterparties.

We may make an upward or downward notching adjustment to reflect our view of the impact of corporate behavior if we judge that any of these factors has a material bearing on a pension manager's overall risk profile. Typically, downward notching would be one notch, but could be up to three notches if we perceive multiple or more deep-seated and serious issues. For example, we may notch downward if we see an aggressive dividend policy combined with rapid growth in new or volatile asset management mandates. Upward notching would generally be limited to one notch. We may notch upward where we perceive sustained, exemplary stewardship over time, and where there is a tangible impact on the pension manager's risk profile.

Constraints on Baseline Credit Assessments

Sovereign Constraint

Pension managers tend to have significant exposure to sovereigns, typically via investments in government bonds and liquidity-related exposure to central banks. Many public pension managers invest heavily in domestic assets, in part because these match the currency of the pension obligations, and these investments are affected by health of the domestic economy and banking system, which in turn are linked to the sovereign's credit quality.

For this reason, a pension manager's stand-alone assessment is typically no higher than the long-term local-currency rating of the country where the public pension manager is domiciled. Where the adjusted scorecard-indicated outcome before the sovereign constraint is higher than the sovereign, we typically cap the stand-alone assessment at the level of the sovereign rating. However, a stand-alone assessment may in some cases exceed the rating of the sovereign. Please see our cross-sector methodology that discusses how we assess the impact of sovereign credit quality on other ratings, including the guidelines that pertain to non-bank financial institutions and sub-sovereigns.¹⁰

Sub-sovereign Sponsor Constraint

Where the pension manager's sponsor is a sub-sovereign, the sponsor's reference rating is often an additional constraint on the stand-alone assessment. In general, the reference rating is the sponsor's long-term issuer or senior unsecured rating. For US public finance, the reference rating is typically the issuer rating or, where there is no issuer rating, the senior-most unenhanced, uncollateralized full faith and credit obligation of the entity, e.g., the general obligation bond of a state or local government.

In assessing the extent of credit linkage to or de-linkage from the sponsor, we consider many of the general principles described in our cross-sector methodology that discusses how we assess the impact of sovereign credit quality on other ratings. We also consider the public pension manager's organizational structure,

¹⁰ A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

political interference, separation or commingling of cash, overlap in access to credit and capital markets, and an insolvency scenario of the sub-sovereign.

- » **Organizational Structure:** A public pension manager can be organized in a variety of ways that create different levels of financial and legal ties to the related government, e.g., as a department or component unit of the government (which usually implies very close credit linkage), or as a separate authority or a separately constituted company (where there may be greater separation).
- » **Political Interference:** Where political interference is meaningful, credit linkage to the sub-sovereign is typically strong.
- » **Dependence on Contributions from the Sponsor:** Where the public pension manager depends on continuing contributions from the sponsor to meet its obligations to creditors, credit linkage is typically very strong. An underfunded pension plan has very strong credit linkage, unless public pension creditors have a durable priority of claim on the pension's assets relative to the pension obligations.
- » **Cash, Investments and Liabilities:** Any commingling of cash implies very close credit linkage to the sponsor, as do situations where the public pension manager has material exposure to the sponsor's debt obligations or is responsible for any material liabilities of the sponsor, beyond the pension obligation.
- » **Overlap in Access to Capital Markets:** We typically consider how the government's credit profile may affect the public pension manager's access to credit and capital markets over time.
- » **Sponsor Insolvency Scenario:** Bankruptcy courts and other courts overseeing insolvency proceedings typically have wide latitude to make decisions affecting creditors' recovery, including the breadth of the entities drawn into the proceedings and whether or not specific debt classes will be subject to a stay in the payment of debt service. Unless there is clear credit de-linkage, the potential for contagion typically limits the extent to which the stand-alone assessment of a public pension manager can be higher than the sponsor's reference rating. Visibility into a bankruptcy scenario is usually very limited until the public pension manager or the sub-sovereign is in, or nearing, distress. Where there is meaningful clarity on likely default scenarios for a public pension manager or its sponsor, there is greater potential for a wider differential in their credit profiles; however, there are also scenarios where the public pension manager's stand-alone assessment and the sponsor's reference rating would converge.

The potential for de-linkage from the sub-sovereign's credit quality is somewhat higher than potential de-linkage from the sovereign, for a variety of reasons. The public pension manager's assets may be invested primarily outside of the sub-sovereign jurisdiction; the health of the sponsor's economy may not affect the country's broader economy or the banking system; the statutes governing the public pension manager and creditors' rights may be determined at a higher level of government than the sponsor; and a sub-sovereign cannot impose a currency moratorium or general debt moratorium.

Other Assessment Considerations

Stand-alone assessments may include additional factors that are not in the scorecard, usually because the factor's credit importance varies widely among the issuers in the sector or because the factor may be important only under certain circumstances or for a subset of issuers. Such factors include financial controls and the quality of financial reporting; assessments of corporate governance as well as environmental and social considerations. Regulatory, litigation, liquidity, technology and reputational risk as well as changes to consumer and business spending patterns, competitor strategies and macroeconomic trends also affect credit profiles.

Following are some examples of additional considerations that may be reflected in our ratings and that may cause ratings to be different from scorecard-indicated outcomes.

Operating Environment

The operating environment of a public pension manager can largely influence its creditworthiness. Economic, judicial/regulatory, institutional and general operating conditions may impact a pension manager's credit fundamentals. When the methodology is used outside the US, Canada and other jurisdictions with similar pension frameworks, material additional risks related to the legal and regulatory frameworks or the status of pension creditors may cause the actual rating to be lower than the scorecard-indicated outcome.

Additionally, regulations across different jurisdictions may entail limitations on operations, higher costs, and higher potential for technology disruptions and demand substitution. Regional differences in regulation, implementation or enforcement may advantage or disadvantage particular issuers from a credit standpoint.

Environmental, Social and Governance Issues

Environmental, social and governance (ESG) considerations may affect the stand-alone assessments of public pension managers. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.¹¹

For example, there may be sponsor or sovereign pressures to invest in riskier assets that are viewed as environmentally or socially more responsible. Similarly, forced divestments from certain types of investments due to environmental or social considerations (e.g., equities in tobacco companies or firearms manufacturers) may constrain investment allocation and return plans.

While governance is incorporated into our assessment of the Corporate Behavior notching factor, in cases where we consider that governance weakness or strength is greater than the scorecard range for this factor, we incorporate this view outside of the scorecard.

Financial Controls

We rely on the accuracy of audited financial statements to assign and monitor stand-alone assessments 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' reports on the effectiveness of internal controls, auditors' comments in financial reports and unusual restatements of financial statements or delays in regulatory filings may indicate weaknesses in internal controls.

Liquidity

Liquidity is an important rating consideration for public pension managers, and ratings can be heavily affected by extremely weak liquidity. While liquidity is specifically considered in the scorecard, when it is very weak, the impact it has on stand-alone assessments may be much greater than the standard scorecard weight would imply. For more information about general principles underlying our liquidity analysis, please see our liquidity cross-sector methodology.¹²

Event Risk

We also recognize the possibility that an unexpected event could cause a sudden and sharp decline in a public pension manager's fundamental creditworthiness, which may cause the stand-alone assessment to be lower than the scorecard-indicated outcome. Material event risks — which are varied and can range from

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

¹² A link to a list of our cross-sector methodologies can be found in the "Moody's Related Publications" section.

sudden regulatory or policy changes to liabilities from an accident — can overwhelm even a stable fund. Some other types of event risks include litigation and significant cyber-crime events.

Additional Metrics

The metrics included in the scorecard are those that are generally most important in assigning ratings to public pension managers; however, we may use additional metrics to inform our analysis of specific pension managers. These additional metrics may be important to our forward view of metrics that are in the scorecard or other rating factors.

Assigning the Baseline Credit Assessment

After considering the scorecard-indicated outcome, other assessment considerations and relevant cross-sector methodologies, we assign a BCA. The BCA does not include our expectations of any extraordinary support from a government or affiliate.

Assessing the Impact of Government and Affiliate Support¹³

After considering the assigned BCA, we typically incorporate any government support using the JDA framework described in our methodology for rating government-related issuers.

In applying the JDA framework and in assessing the relative credit profiles of the public pension manager and the sponsor/supporter,¹⁴ we incorporate issuer-specific considerations. Public pension managers are entities that are often very closely integrated into public sector operations and finances or that have a close and enduring alignment of interests and objectives with public sector entities. In many cases, the linkages between the sponsor/supporter and the pension manager are very strong, because of the alignment of interests and because the monies that are deposited into the pension fund are raised from the same economic base that underpins the sponsor's other revenues. Even where public pensions are fully funded relative to the net present value of their future obligations to current employees and retirees, sponsors/supporters typically also provide ongoing contributions to fund obligations related to future service for current and future employees. These contributions are typically more important to meet future obligations when the plan is underfunded, unless the obligations are reduced or the government is willing for a portion of future benefits to be paid from its general revenues.

The actions of the government provide insights that are especially important as the ratings of a government/sponsor/public pension manager move down the rating scale and there is typically greater potential for divergence in their relative default probabilities or expected relative recoveries. For instance, a sub-sovereign in a stress scenario may take actions that provide insights into which of its various spending priorities will receive precedence (e.g., payments to pension beneficiaries, general obligation debt service, debt service of the pension fund or funding for general governmental services). The sub-sovereign's prioritization may affect relative default probabilities and expected recoveries.

Using the JDA Framework for Jointly Sponsored Funds

In applying the GRI JDA scorecard framework to jointly sponsored public pension funds, we typically use the aggregate supporter credit profile, which is based on the sponsors' respective credit profiles, the distribution of their commitments and credit profiles (e.g., similar versus disparate credit profiles or a large number of

¹³ Since all public pension managers are government-related issuers, support from the government is typically the primary support consideration. Where the supporter is an affiliate, the considerations would be very similar.

¹⁴ In the context of our analysis of public pension funds, we use the term sponsor to refer to the participating governments (employers) of the employees (plan members or pensioners) who will receive pension benefits. The term supporter refers to the sponsor(s) or other governmental entities involved in funding/maintaining pensions or pension contributions whom we view as likely to provide extraordinary support to these government-related issuers.

sponsors with relatively similar commitments versus concentration in certain sponsors), the legal nature of their commitments, and the relationship of the sponsors to one another (for instance, all sponsors are separate municipalities with no expectation of mutual support beyond legally binding commitments, versus a mix of municipalities and regional/provincial governments that may have a common interest in supporting all of the municipalities).

- » If the sponsors' commitments are joint and several and we have an expectation that the highest-rated sponsor would have the capacity and willingness to meet the obligations of the other sponsors, the highest sponsor rating would typically represent the aggregate supporter credit profile.
- » If there is an anchor sponsor – an entity that has a substantial share of the aggregate commitments (or a significant role in funding the commitments) and is at a higher level than the other sponsors (e.g., a state/provincial or regional government anchor with the remaining sponsors being local governments in that entity's jurisdiction over which it has substantial legal authority), the anchor sponsor's rating would likely be used as the aggregate supporter credit profile even if the sponsors' obligations are not joint and several, provided we expect that entity to have a meaningful interest in maintaining the integrity of the public pension fund. In cases where the distance between the credit quality of the anchor sponsor and the weighted average credit quality of the other sponsors is marked, we may apply a downward adjustment from the anchor sponsor's rating.
- » If there is no anchor sponsor and commitments are not joint and several (incorporating capacity and willingness considerations), we typically use a rating that approximates the weighted average of the sponsors' credit ratings as the aggregate supporter credit profile, provided the ratings are not very disparate. In cases of material concentration in weaker sponsors, we may consider that the aggregate supporter credit profile is lower than the weighted average would imply. Where such concentrations are pronounced, we may use a weakest link or modified weakest link approach.

After incorporating government and affiliate support considerations into the BCA, we arrive at a preliminary credit assessment.

Assigning Issuer-Level and Instrument-Level Ratings

After considering the preliminary credit assessment and, as described below, considerations relating to loss and recovery rates in a default scenario, we typically assign an issuer rating or senior unsecured debt rating. We may also assign a Counterparty Risk Rating (CRR) to a public pension manager.¹⁵

In cases where the credit obligations of a public pension manager benefit from priority of claim, the issuer rating or senior unsecured debt rating may be higher than the preliminary credit assessment. In cases where we expect that the credit obligations of a public pension manager are likely to be subordinated to the pension manager's other obligations, notably the pension benefit obligations, the public pension manager's ratings may be lower than the preliminary credit assessment.

Were a public pension manager to issue debt instruments other than senior unsecured debt, individual debt instrument ratings may be further notched upward or downward from the senior unsecured rating or issuer

¹⁵ CRRs are opinions of the ability of entities to honor the uncollateralized portion of some non-debt counterparty financial liabilities (CRR Liabilities) and also reflect the expected financial losses in the event such liabilities are not honored. Please see *Rating Symbols and Definitions* for more details on CRRs and CRR Liabilities (a link can be found in the "Moody's Related Publications" section below). In most cases, the CRR would be assigned at the same level as the pension fund's senior unsecured rating or issuer rating, reflecting our expectation that these issuers would most likely be subject to a normal insolvency process and therefore financial liabilities covered by the CRR would have similar expected loss as senior unsecured debt obligations. To the extent that a public pension fund's circumstances cause us to have a view that the probability of default or loss given default of CRR liabilities would be materially different from senior unsecured debt, CRRs would reflect those differences.

rating to reflect our assessment of any differences in expected loss arising from an instrument's seniority and any collateral.

Priority of Claim

The expected priority of claim of a public pension manager's rated obligations (typically, its debt) relative to its other obligations (typically, pension benefit obligations) is an extremely important rating factor that strongly affects loss and recovery rates in a default scenario and can also provide insights into the sponsor/supporter's priorities.

Assessing the Existence and Sustainability of Priority of Claim

Our view of the priority of the public pension manager's rated obligations to its obligations to make pension payments is typically informed by stated legal priority, while also taking into account precedent and our expectations of how governments may act to favor pension beneficiaries or creditors in a stress scenario.

Because there is almost always significant political and economic incentive for a pension sponsor to place a high priority on the payment of pension benefits to retirees, meaningful priority of claim for rated debt obligations (also called creditor preference) can usually only be established by statute or decree enacted at a higher level of government (e.g., a national statute where the sponsor/supporter is a sub-sovereign). Strong rule of law and an independent judiciary that enforces creditor rights are also important. Precedent may also play a role. A precedent of any contravention or ineffectiveness of creditor preference would be a very meaningful negative indicator. In the absence of statutory creditor preference, the precedent for creditor preference would need to be well established and consistent for us to consider that there is a sustainable priority of claim.

Potential for Upward Notching Based on Sustainable Priority of Claim

Where priority of claim for rated obligations is clear and sustainable, the upward lift relative to the preliminary credit assessment is based on (i) the size of the layer of subordinated claims in proportion to the rated claims (based on the leverage ratio) and (ii) the pension funding position (based on the funding ratio). Both of these considerations are important because a default can be primarily liquidity-driven (i.e., a scenario of a liquidity crisis with a high pension funding ratio, where creditors would likely obtain the full benefit of the subordination layer), or it can be primarily insolvency-driven (i.e., a default scenario with a low pension funding ratio, where maintaining creditor preference in bankruptcy proceedings would likely entail reducing future benefits to pension-holders). Government-sponsored plans are often established for a large portion of the sponsor's public sector workforce, and imposing losses on such a group in order to keep institutional investors whole in a default scenario would likely be politically difficult. The courts that administer insolvency proceedings often have considerable leeway in resolving claims. As a result, the likelihood that creditors would be placed before pension beneficiaries diminishes as the funded status of the plan deteriorates. Thus, in addition to considering the legal priority of claim and the size of the layer of subordinated claims to assess the potential for upward notching, we also consider the pension manager's funding position, which can limit the potential upward notching.

Leverage ratio. The numerator is total senior obligations, and the denominator is total assets. In calculating or estimating the ratio, we incorporate applicable adjustments described in our cross-sector rating methodology that discusses financial statement adjustments in the analysis of financial institutions. We may make additional adjustments, for instance to reflect specific provisions in the public pension manager's counterparty netting agreements. For example, where there is a material amount of non-recourse debt and we consider that the pension manager is unlikely to provide support if the underlying project encounters financial or operational difficulty, we may adjust the numerator accordingly. Similarly, we may adjust the numerator where we consider that a material amount of off-balance debt will crystalize as a liability for the pension manager. For notching, we use a forward-looking, sustainable leverage ratio that is informed by the

recent historical ratio based on the pension manager's financial statements and other public disclosures. We also consider developments that could have a material impact on the ratio, and the ratio's trend.

Funding ratio. Please see the "Discussion of the Scorecard Factors" section for a description of how we calculate or estimate the funding ratio. For notching based on priority of claim, we use a forward-looking, sustainable funding ratio that is informed by the recent historical ratio based on the pension manager's financial statements and other public disclosures. We also consider developments that could have a material impact on the ratio, and the ratio's trend.

For pension managers that only manage pension assets (i.e., reserve funds), the funding ratio score typically incorporates our view of the plan's funding ratio if we were to calculate Net Assets / PBO including our estimate of the portion of the sponsor's projected benefit obligation that we believe the reserve fund will be expected to meet.

Combining the ratios. We use the table in Exhibit 4 to combine the leverage and funding ratio results to arrive at the upward notching that is typically applied. A public pension manager's rating can be up to three notches higher than the preliminary credit assessment but is typically constrained by the sovereign rating.

EXHIBIT 4

Indicative Notching Guidance¹⁶

		Leverage Ratio (%)		
		≤ 10	10 - 25	> 25
Funding Ratio (%)	> 90	3	2	1
	70 - 90	2	2	1
	50 - 70	2	1	0
	≤ 50	0	0	0

Source: Moody's Investors Service

Impact of a Preferred Status for Pension Benefit Obligations

In cases where the legal priority of claim of rated obligations is subordinate to other preferred obligations (especially pension fund payments, since they usually represent the bulk of liabilities), rated obligations are generally multiple notches below the preliminary credit assessment.

In cases where the legal priority of claim of rated obligations and other obligations (including pension payments) are pari passu and we consider that the treatment in default will also be pari passu (i.e., the stated priority is the same as the de facto priority), there is usually no downward notching from the preliminary credit assessment based on priority of claim. However, if we consider that rated obligations will be treated as subordinate in an event of default, even if the stated priority of claim is pari passu or senior to other obligations (i.e., de facto subordination), rated obligations are generally multiple notches below the preliminary credit assessment.

In addition to the stated priority of claim and our expectations of the de facto priority of claim, we may also consider how the actions of the sponsor could affect the relative likelihood of default of rated obligations and pension obligations. If we consider that the sponsor will prioritize the payment of pension obligations over the public pension fund's debt, ratings may be many notches below the preliminary credit assessment.

¹⁶ The table describes indicative upward notching for pension managers where we assess that creditors have clear priority of claim over pension beneficiaries.

Assumptions

Key assumptions that apply in this sector include our view that sovereign credit risk is strongly correlated with that of the sovereign's domestic issuers, that legal priority of claim meaningfully affects average recovery on different classes of debt 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 assessment considerations that may be important in assigning stand-alone assessments, and certain key assumptions. In this section, we discuss limitations that pertain to the scorecard and to the overall rating methodology.

Limitations of the Scorecard

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

The scorecard in this rating methodology is a relatively simple tool focused on indicators for relative credit strength. 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 company's circumstances.

Factors that are outside the scorecard, including those discussed above in the "Other Assessment Considerations" section, may be important for stand-alone assessments, 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 stand-alone assessments in this sector.¹⁷ Examples of such considerations include the following: how sovereign credit quality affects non-sovereign issuers and the assessment of credit support from other entities.

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

General Limitations of the Methodology

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

Stand-alone assessments for public pension managers reflect our expectations for an issuer's future performance; however, as the forward horizon lengthens, uncertainty increases and the utility of precise estimates, as scorecard inputs or in other rating considerations, typically diminishes. In any case, predicting the future is subject to substantial uncertainty.

¹⁷ A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

Appendix A: 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,¹⁸ 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 company'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 a public pension manager'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.

All of the quantitative credit metrics incorporate our standard adjustments¹⁹ to financial statements in the analysis of financial institutions. We may also make other analytical adjustments that are specific to a particular company.

The initial score for each sub-factor is based on historical or projected financial data, as outlined below in the factor discussions, and is a useful starting point for our analysis of the sub-factor. The pension manager scorecard provides the ability to show how our forward-looking expectations for financial metrics (which are incorporated into the final scoring) vary from historical results. The assigned score for each quantitative sub-factor incorporates this forward view and other pertinent considerations. The magnitude of any adjustment to the score is primarily based on our analytical interpretation of the extent to which the initial score is not an accurate reflection of future trends. In our forward-looking expectations, we may consider events (wide-ranging or issuer-specific) that may recently have occurred, or are likely to occur in the foreseeable future, that could significantly affect the pension manager's future results and financial position. In addition, we may also perform revenue, expense and cash flow stress tests, and consider a pension manager's resilience or susceptibility to a stress scenario in our assigned scores. Some typical reasons why our assigned scores for each of the financial ratio sub-factors may be different from our initial score based on historical results are described in the "Discussion of the Scorecard Factors" section.

2. Mapping Scorecard Factors to a Numeric Score

After estimating or calculating each sub-factor, the outcomes for each of the qualitative sub-factors are mapped to a broad category on Moody's BCA scale (aaa, aa, a, baa, ba, b, caa or ca, also called alpha categories) and to a numeric score. The outcomes for each of the quantitative sub-factors are mapped to an alphanumeric score on the BCA scale (e.g. aa2) and to a numeric score.

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

¹⁸ 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.

¹⁹ For an explanation of our standard adjustments, please see the cross-sector methodology that describes our financial statement adjustments in the analysis of financial institutions.

aaa	aa	a	baa	ba	b	caa	ca
1	3	6	9	12	15	18	20

Source: Moody's Investors Service

Quantitative factors are scored on an alphanumeric scale. For each metric, the scorecard shows the range by alpha category. To arrive at an alphanumeric score, the alpha range is divided into three equal alphanumeric ranges, to which the metric is mapped. For example, if the scorecard indicates that a ba range for a particular metric is 3 to 4.5x (with 4.5x being strongest), the alpha range is divided into a range of 3 to 3.5x, which corresponds to a score of ba3; a range of 3.5 to 4x, corresponding to a score of ba2; and a range of 4 to 4.5x, corresponding to a score of ba1. The scorecard shows the corresponding unadjusted alphanumeric score for the sub-factor.

Unadjusted and assigned sub-factor scores are then converted to numeric values of 1 to 20, based on the table below (Exhibit 5).

EXHIBIT 5

Rating Scale Numeric Equivalents

Alphanumeric	Numeric Equivalent
aaa	1
aa1	2
aa2	3
aa3	4
a1	5
a2	6
a3	7
baa1	8
baa2	9
baa3	10
ba1	11
ba2	12
ba3	13
b1	14
b2	15
b3	16
caa1	17
caa2	18
caa3	19
ca	20

Source: Moody's Investors Service

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),²⁰ with the results then summed to produce an aggregate numeric score before notching factors (the financial profile outcome). We then consider whether the financial profile

²⁰ See Exhibit 2 for a reference to how weights can vary.

outcome that results from the weighted factor should be notched upward or downward²¹ in order to arrive at an aggregate numeric score that is the scorecard-indicated outcome before constraint, based on our assessment of Political Independence and Corporate Behavior. In aggregate, the notching factors can result in up to two upward notches or six downward notches from the preliminary outcome to arrive at the scorecard-indicated outcome before sovereign and sponsor constraints. This outcome may then be capped based on the rating of the sovereign or the sponsor to arrive at the scorecard-indicated outcome.

The aggregate numeric score corresponding to the financial profile outcome and the scorecard-indicated outcome before constraints are 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 before constraints. Sovereign and sponsor constraints are entered as alphanumeric. The scorecard-indicated outcome is the lower of the scorecard-indicated outcome before constraints, the sovereign constraint and the sponsor constraint.

EXHIBIT 6

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

The scorecard-indicated outcome is oriented to the BCA.

²¹ Numerically, a downward notch adds 1 to the score, and an upward notch subtracts 1 from the score.

Appendix B: Public Pension Manager Stand-alone Assessment Example Scorecard

	Historical			Assigned		
	Factor Weights	Historic Ratio	Initial Score	Assigned Score	Key driver #1	Key driver #2
Funding Ratio*	60%	65.0%	ba2	ba2		
Net Assets / PBO						
Liquidity	13%	205.0%	aaa	aaa		
Liquidity Inflows / Outflows						
Asset Quality	13%	65.0%	baa2	a3	Expected Trend	
High Risk Assets / Gross Assets						
Financial Policy	13%	baa	baa	a	Expected Trend	
Financial Policy						
Financial Profile Outcome	100%		baa3	baa2		
Qualitative Notching						
Political Independence				0		
Corporate Behavior				0		
Scorecard-Indicated Outcome Before Constraint				baa2		
Consideration of: Sovereign Constraint					Comment	
				No		
				A3		
				No		
				Aaa		
Scorecard-Indicated Outcome				baa2		

Source: Moody's Investors Service

Appendix C: Liquidity Haircuts and Recognition Rates

We utilize uniform haircut rates for each major type of investment for the purpose of calculating inputs to the liquidity ratio. Our calculations are based on fair value classification disclosures required under US GAAP and IFRS. We believe these fair value classifications, detailed below, provide a benchmark measure of relative liquidity, allowing for consistency and comparability across pension managers.

- » **"Level 1" financial assets** are those with fair values based on unadjusted quoted prices in active markets for identical assets. Accordingly, Level 1 financial assets tend to be the most liquid securities and investments, and therefore, we apply the most favorable haircut rates to these.
- » **"Level 2" financial assets** are generally less liquid than Level 1 assets. Their fair values are determined based on observable inputs other than Level 1 prices, such as quoted prices for similar assets, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets. Accordingly, we apply less favorable haircut rates to these financial assets compared with those that are classified as Level 1.
- » **"Level 3" financial assets** are the least liquid of the three categories, in that their fair values are determined based on unobservable inputs that are supported by little or no market activity. Their fair values are typically based on subjective internal financial models, which use the best information available to the pension manager. Accordingly, we apply the least favorable haircut rates (100%) to these financial assets, compared with those that are classified as Level 1 and Level 2.

The haircut rates we apply to each broad category of securities and investments are detailed below in Exhibit 7, together with our base estimated allocations when there is insufficient reporting of fair value classifications in the financial statements.

- » Under a minority of local accounting jurisdictions, fair value classifications are not disclosed in the footnotes, or the classifications may be disclosed in less detail than is typically presented under US GAAP and IFRS. In such cases, we utilize all available information to estimate the fair value classifications of the investment portfolio. Our estimates are based on Exhibit 7; however, in some cases we may adjust these percentages, based on our review of other related disclosures and information, and using our general knowledge of the pension manager and its activities. Typically, the percentages employed are more conservative if information is less complete.
- » A pension manager may measure what is typically a minority of its investments on a basis other than at fair value. We include these financial assets in our calculations, but our estimates of their fair value classifications are typically more conservative when standard disclosures are not provided in the financial statements.
- » For derivative assets, the amounts provided under the fair value classification disclosures reconcile to amounts reported on the balance sheet. Therefore, the amounts do not reflect additional offsetting that may be available under legally enforceable master netting agreements. When applying our standard adjustment for balance sheet offsetting of derivatives, we first net Level 1 derivative assets, then any remaining amounts are netted with Level 2 derivative assets, and finally any remainder is applied to Level 3 derivative assets.
- » Under US GAAP, reporting entities can elect to use net asset value (NAV) per share as a practical expedient for measuring the fair value of certain investments. For investments measured using the NAV per share practical expedient, US GAAP does not require reporting entities to disclose in their financial statements the fair value classifications for those investments. We estimate the haircut for such investments based on the investment's redemption frequency, as follows: (i) for investments that can be redeemed on a daily basis, we assign a haircut equivalent to that for Level 1 equity securities (i.e.,

20%); (ii) for investments that can be redeemed on a monthly or quarterly basis, we assign a haircut equivalent to that for Level 2 equity securities (i.e., 50%); and (iii) for investments that have longer redemption periods, we assign a haircut equivalent to that for a Level 3 equity security (i.e., 100%). We treat investments measured using the NAV per share practical expedient, but for which the redemption frequency is not disclosed, as Level 3. We may override these estimates based on review of other disclosures and issuer and market knowledge.

EXHIBIT 7

Liquidity Haircuts

	Fair Value Hierarchy % Haircut Rates			Fair Value Hierarchy Allocations		
	Level 1	Level 2	Level 3	If there is insufficient fair value hierarchy information available, we estimate the following composition, subject to override based on review of other disclosures and issuer and market knowledge		
Cash	0%	N/A	N/A	100%	0%	0%
Contributions Receivable	0%	N/A	N/A	100%	0%	0%
Interest, Dividend, Rental Income (net of fees)	0%	N/A	N/A	100%	0%	0%
Contributions	0%	N/A	N/A	100%	0%	0%
Sovereign Government Debt Securities	3%	20%	100%	75%	25%	0%
Semi-government/Government Agencies Debt Securities	3%	20%	100%	0%	100%	0%
State/Municipal Government Debt Securities	3%	20%	100%	0%	100%	0%
Other Debt Securities	10%	30%	100%	0%	90%	10%
Equities	20%	50%	100%	80%	20%	0%
Derivatives	10%	30%	100%	0%	100%	0%
Loans and Other Receivables	20%	50%	100%	0%	50%	50%
Physical Commodities	20%	50%	100%	0%	80%	20%
<i>Treatment of Specific Classifications When No Further Detail Is Reported:</i>						
"Trading Securities"	10%	30%	100%	0%	100%	0%
"Investments"	20%	30%	100%	0%	20%	80%
"Government, Corporate and Other Debt Securities"	8%	25%	100%	25%	75%	0%
"Other"	20%	30%	100%	0%	0%	100%
"Financial Assets Designated at Fair Value Through Profit or Loss"	20%	50%	100%	0%	50%	50%
% Haircut Rate						
Reverse Repos	3%					

Source: Moody's Investors Service

EXHIBIT 8

Recognition Rates for Off-Balance-Sheet Commitments and Contingencies

	Total
Maximum Exposure to Loss in Off-Balance Sheet Structured Vehicles (e.g., variable interest entities and special purpose entities), Net of Amounts Recognized on Balance Sheet	5%
Lending Commitments	10%
Underwriting Commitments	30%
Letters of Credit	30%
Commitments to Related Party (e.g., equity commitments and lending commitments)	100%
Rating Triggers (i.e., outflows due to rating downgrade)	100%
Other Commitments and Guarantees	10%

Source: Moody's Investors Service

Moody's Related Publications

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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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