MOODY'S INVESTORS SERVICE

RATING METHODOLOGY

Government-Related Issuers

Table of Contents:

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This rating methodology replaces the *Government-Related Issuers* methodology published in August 2017. The principal revision is the explanation of our approach to assigning a new rating class, Counterparty Risk Ratings, to public pension funds, in Appendix VI. In the discussion of dependence for the GRI scorecard, we have provided additional clarity on scoring and a more precise presentation of the ranges in Exhibit 2.

Summary

This methodology explains how Moody's assigns ratings to Government-Related Issuers (GRIs) and our view of the credit links between GRIs and their supporting central, regional and local governments. This document describes the core principles of our Joint Default Analysis (JDA) approach, which is our standard approach to assigning ratings to GRIs in most cases, as well as the supporter-based approach we use in some cases.

In the vast majority of cases, our rating approach is to assign a Baseline Credit Assessment (BCA) which represents our opinion of the GRI's standalone intrinsic strength, and then to determine the uplift that reflects the probability of the government providing extraordinary support. However, in a more limited number of cases, the level of integration between the issuer and its government is so strong that a standalone credit analysis is either irrelevant or misleading. In those cases our rating assessment is focused solely or primarily upon support.

This document provides general guidance intended to help the reader understand how qualitative and quantitative risk characteristics are likely to affect rating outcomes for GRIs. This document does not include an exhaustive treatment of all factors that are considered by our analysts and reflected in Moody's ratings. Our JDA framework includes a scorecard, which is a reference tool that can be used to approximate credit profiles for GRIs in most cases and to explain, in summary form, the factors that are generally most important in assigning ratings to GRIs.

The JDA scorecard used for this methodology does not include every rating consideration, and other quantitative or qualitative considerations that may not lend themselves to a transparent presentation in a scorecard format can also affect assigned ratings. In addition, ratings are based on our forward-looking expectations. As a result, the JDA scorecard outcome is not expected to match the actual rating of each GRI.

This methodology describes the analytical framework used in determining credit ratings in this sector. In some instances our analysis is also guided by additional publications which describe our approach for analytical considerations that are not specific to any single sector. Examples of such considerations include but are not limited to: the assignment of short-term ratings, the relative ranking of different classes of debt and hybrid securities, how sovereign credit quality affects non- sovereign issuers, and the assessment of credit support from other entities. A link to documents that describe our approach to such cross-sector methodological considerations can be found in the "Moody's Related Publications" section of this report.

Rated Universe of GRIs

We define a GRI as an entity with full or partial government ownership or control, a special charter, or a public policy mandate from the national, regional or local government. We generally use 20% as the minimum government ownership level before we consider an issuer to be a GRI. We normally do not designate subsidiaries of GRIs as also being GRIs; our usual approach is to treat such subsidiaries as non-GRI and to consider any benefits from government ownership and support on a qualitative basis. In some rare cases, an issuer that is fully or partially owned (or controlled) by another GRI may also be treated as a GRI. By their nature, GRIs are generally strategically important entities and prominent issuers within their respective markets.

Given the unique constitutional framework of the US, including the enumerated separation of powers across levels of government, US states, municipal entities, and the revenue enterprises and other entities they establish are not rated as GRIs under this methodology, with the exception of US state and municipal pension funds. In addition, this methodology applies to enterprises that are owned or sponsored by the US federal government.

Rating approach for GRIs

Standard approach: BCA with uplift

Our credit analysis of GRIs typically starts with an assessment of the GRI's standalone strength – its ability to service and repay outstanding debt without recourse to extraordinary support from the supporting government.

When assigning a BCA, standalone strength is evaluated using the published sector-specific methodology that is most suitable for the predominant activities of the GRI.

We factor into our assessment of standalone strength any day to day support received from the government that can be clearly distinguished from extraordinary support.[1] For example, where a GRI relies for its liquidity on day to day flows from government departments, we will reflect the reliability of those flows in our standalone assessment. Furthermore, our analysis of governance incorporates our assessment of the impact of routine interaction with government departments in determining strategy, complying with regulations or managing day to day operations. Support mechanisms, such as an obligation of the government to ensure the GRI's solvency and liquidity, are reflected in the BCA when they are legally or contractually documented.

Having assigned a BCA, we then determine the GRI's debt rating, including any uplift due to systemic support, using the JDA framework as a tool that helps inform our rating decision.

[1] Please see the "Extraordinary Support" section below for a broader discussion and further detail on the definition of extraordinary support.

GRIs without a BCA, rated based on support; the approach for cases when assigning a BCA is not relevant

We believe that assigning a BCA is almost always helpful to investors, since it allows us to more clearly express our views on the probability that a GRI will experience difficulty servicing or repaying debt, and that the government will then step in to help. However, it is not possible or meaningful to assign a BCA in every case. In some instances the GRI is so inextricably linked to the government that a meaningful standalone BCA cannot be derived. In such cases we use a top-down analytical approach that chiefly considers the ability and willingness of the government to provide timely support, instead of the usual bottom-up approach of starting with the BCA and then considering uplift towards the government's rating.

Appendix II of this methodology explains the circumstances in which we are likely to use a top-down analytical approach, and discusses the factors we take into account when deciding to assign a rating at, or near, the rating of the relevant government.

Assigning a BCA with consideration of possible uplift: the JDA Framework[2]

Experience has demonstrated the need for a robust approach to rating GRIs, based on rigorous assessments of GRI-specific credit risks and a careful understanding of why governments decide to bail out certain entities while leaving others to default. On the one hand, we have seen many examples of governments' willingness to support strategic assets even when they are not contractually obliged to do so. On the other hand, credit cycles have also revealed the adoption of more targeted, or selective, support strategies by some countries, indicating limits in the public sector's capacity to socialize credit risks.

Support assumptions need to recognize that governments facing large contingent liabilities may resort to credit ring-fencing, providing support to a selective group of GRIs, while allowing others – deemed less important – to fail. While ring-fencing may help to sustain long-term sovereign credit fundamentals, it is detrimental to the credit quality of GRIs that a government chooses not to prioritize, not least because a GRI is more likely to have a need for extraordinary support during an economic or financial crisis. Support assumptions are assigned conservatively in countries characterized by low policy transparency and predictability, where it can be difficult to decipher government intentions. Furthermore, given that government behavior can change during periods of stress, we typically apply additional scrutiny in assessing cases where support assumptions lift the rating of GRIs with weak baseline credit assessments to the level of the supporting government (i.e. rating at par) in the absence of critical features that offer near certainty surrounding the likelihood of support.

Joint Default Analysis (JDA) first includes an assessment of the standalone credit profile of a GRI and then considers both an estimate of the likelihood of extraordinary support and an assessment of the likely solvency of the supporting government in such a scenario.

Our approach explicitly accounts for:

» the GRI's standalone risk or Baseline Credit Assessment (BCA)

» the supporting government's rating

» an estimate of the default correlation between the two entities (dependence)

» an estimate of the likelihood of extraordinary government support (support)

[2] A full, technical discussion of JDA is available in "Appendix I: Technical Overview of JDA."

The BCA is defined on a lower case alphanumeric rating scale (aaa to c) and represents the intrinsic credit strength of a GRI, accounting for all ongoing transfers, subsidies or long-term contracts from the supporting government, but absent any concept of extraordinary support. Essentially, the BCA indicates our view of the likelihood that the GRI would default in the absence of extraordinary support. As noted above, guidance on the assignment of BCAs is outlined in various sector-specific rating methodologies.

Default dependence reflects the tendency of a GRI and its supporting government to be jointly susceptible to adverse circumstances that simultaneously move them closer to default. This methodology provides detailed guidance on the factors we assess to determine the degree of default dependence for a GRI and its supporting government.

Extraordinary support is assessed by determining the likelihood that the supporting government would act in a timely manner to prevent a default of a GRI. Support may take different forms, ranging from formal guarantees to cash injections or actions that enhance the GRI's access to interim financing. This methodology explains the factors that we assess to determine the likelihood of extraordinary support being made available.

Issues related to the technical foundation of JDA and how Moody's applies JDA to GRIs in special circumstances are discussed in the appendices. Appendix I provides a technical overview of JDA. Appendix II covers GRIs without a BCA, which are rated solely or primarily on support. Appendix III discusses the issue of rating a GRI at par with the government rating when the BCA is significantly lower. Appendix IV discusses how we deal with cases of multiple government supporters. Appendix V considers the rating approach for junior debt hybrids and other junior instruments issued by GRIs. Appendix VI describes the approach for rating public pensions and public pension managers (collectively, public pension funds), which are a sub-set of GRIs typically rated based on support without assigning a Baseline Credit Assessment (BCA).

Default Dependence

Default Dependence Defined

In the application of JDA to GRIs, default dependence (dependence) reflects the joint susceptibility of a GRI and its supporting government to adverse circumstances that simultaneously move them closer to default. Since the capacity of the supporting government to provide extraordinary support – and prevent a default by a GRI – is conditional on its solvency, the higher the level of correlation between the two obligors' default risks, the lower the benefits derived from joint support.

Accordingly, default dependence is employed to reflect the likelihood that the credit profiles of two obligors may be imperfectly correlated. This has important diversifying effects influencing the joint-default outcome. Intuitively, if the default probabilities of a GRI and its supporting government are uncorrelated, implying that their respective credit profiles are independent of one another, the likelihood that the two entities would simultaneously default is less than the probability of either one defaulting on its own. In contrast, if their default probabilities are correlated, implying that the credit profiles are not independent of one another, the probability that the two entities may simultaneously or sequentially default is heightened.

Levels of Dependence

Within the JDA framework for GRIs, we set default dependence at one of four levels: low (30%), moderate (50%), high (70%) and very high (90%). The use of four buckets allows us to assess dependence at a conceptual level and to avoid complex attempts to differentiate default correlation across a more open-ended spectrum. In most cases, GRIs demonstrate moderate to very high degrees of default dependence

with their supporting governments, which reflects the existence of institutional linkages and shared exposure to economic conditions that draw credit profiles together.

Determining Dependence

When determining the level of dependence for a given GRI and its supporting government, rating committees can apply a wide range of discretion but generally focus on three broad factors: (1) the extent to which the GRI and government are operationally and financially linked; (2) the extent to which the GRI and government rely on the same economic or revenue base; and (3) the extent to which the GRI and government are exposed to common credit risks.

Operational and Financial Linkages

The first step in assessing default dependence consists of analyzing the operational status of the GRI. A GRI operating as a commercial venture, with no visible ties to the supporting government, may possess a distinct credit profile. However, a GRI with clear operational or administrative linkages to the government, including an explicit and well recognized mandate to carry out a government responsibility, would tend to have a credit profile that overlaps with that of the government, suggesting a very high level of default dependence.

In conjunction with operational status, financial linkages between the two entities may also connect the two credit profiles. For instance, a structural reliance on government transfers or subsidies may provide a channel through which financial stress is communicated between the government and the GRI. Likewise, in cases where the GRI sends dividends to the government, or where the GRI relies on the government for a significant share of its annual sales, financial pressure may also be transferred between the two entities under a stress scenario.

Key Metrics

» Direct and Indirect Government Transfers as a % of GRI Revenue

» Government Purchases as a % of GRI Revenue

» GRI Payments (Dividends) to Government as a % of Government Revenue

Reliance on Overlapping Revenue Base

The second step in determining default dependence consists of assessing the extent to which the GRI and the government derive their income from the same revenue base or economic space. For instance, a GRI with an export-oriented business model may not be exposed to the same revenue shocks as the central government, whose revenues are influenced predominantly by fluctuations in domestic economic performance.

Accordingly, in determining the degree of overlap in revenue bases, our analysis focuses on the extent to which the income of both the GRI and the supporting government is derived from within a common economic space.

Key Metrics

» GRI: Exports as a % Revenue

» Sovereign Supporting Government: Externally Derived Revenues as a % of Revenue

» Sub-Sovereign Supporting Government: Intergovernmental Transfers[3] as a % of Revenue

[3] Transfers from the central government and income derived from an economic space larger than that of the sub-sovereign territory.

Exposure to Common Credit Risks

The third step in assessing default dependence consists of analyzing the extent to which the GRI and the supporting government are exposed to common credit risks. For instance, depending on the structure of their debt obligations, exchange rate volatility may pose a common credit risk for the GRI and the government, causing their default probabilities to move in tandem. Likewise, in the context of developing economies, unstable political environments may lead to political event risk (e.g. a coup, revolution, civil strife or paralysis of the political system) with adverse consequences for both the GRI and the government. The assessment of exposure to common risks may overlap with previously discussed factors, as in the case where both the GRI and the government rely upon a similar industry or product (e.g. single commodity export), or it may take other forms.

Key Considerations

» Foreign Exchange Risk in Debt Structure

» Shared Industry Exposure

» Political Event Risks

Extraordinary Support

Extraordinary Support Defined

Extraordinary support (support) represents the probability that a government owner of a GRI would provide financial support, or other contractual protections, to a GRI to avoid a default on its debt obligations. Support may be supplied either directly by a government or provided indirectly through third parties under the influence of the government – for example, the provision of emergency finance by banks under the direction of a government. In general, support encompasses any assistance provided outside of the ordinary course of business that avoids a default by the GRI.

Many GRIs receive ordinary support, which would typically be considered in their BCA; whereas extraordinary support is not captured in the BCA but rather considered in the JDA analysis.

The decision whether a particular kind of support is ordinary versus extraordinary is typically based on highly issuer-specific, idiosyncratic considerations. While extraordinary support helps avoid a default, a supporter may not wait until default is imminent to provide extraordinary support – the government support could provide support to avoid default on a very forward looking basis. The regularity or frequency of actions undertaken to support a GRI may provide indications of the ordinary versus extraordinary nature of the support, which we characterize based on a forward-looking view.

Support is not double-counted. More specifically, the expectation of a continuation of ordinary support does not constitute extraordinary support. However, in some circumstances, the provision of ordinary support may be viewed as an indicator of willingness to provide extraordinary support.

Levels of Support

Within the JDA framework for GRIs, we classify dependence into four ranges and support into five ranges (see sections below for details). The use of ranges, rather than specific percentage points, recognizes the inherent uncertainty surrounding assessments of potential support. By definition, support is provided in a stressed environment, thus making it difficult to pinpoint the circumstances impacting an eventual support decision.

EXHIBIT 1

Some Key Considerations for our Assessment of GRI Support

Structural Factors
1. Guarantees
2. Ownership
3. Barriers to Support
Willingness Factors
4. Government Intervention
5. Political Linkages
6. Economic Importance

Determining Support

In determining the level of support for a GRI, rating committees can apply a wide range of discretion but generally focus on three structural factors and three factors explaining the level of the government's willingness to provide support. Structural factors address the legal and quasi-legal aspects of the government's relationship with the GRI and include: (1) guarantees, (2) ownership level and (3) barriers to support. The factors underlying willingness consider the softer connections between the two entities and include (4) the level of government intervention, (5) political linkages and (6) economic importance.

Guarantees

An analysis of the existence or non-existence of guarantees is essential to determining potential support. While guarantees come in a variety of different strengths and forms, suggesting differing levels of support for GRIs, they demonstrate a contractual, or, at a minimum, a moral obligation to assist a GRI on the verge of default. The three main types considered are (a) explicit guarantees, (b) verbal guarantees and comfort letters, and (c) special legal status.

» Explicit guarantees. An explicit, legally binding guarantee, covering all of the GRI's debt obligations in a timely manner, usually suggests a very high likelihood of support and lifts the GRI's rating to the level of the supporting government. However, if only a portion of debt is guaranteed, the rating for the remaining non-guaranteed amounts may reflect a differentiation in the government's intention to support various classes of debt.

» Verbal guarantees and/or comfort letters. While these are judged on their individual merits – with their value dependent upon the person or entity giving the guarantee, the language used, the length of time since the guarantee was given and whether it was given publicly or only to Moody's – they illustrate a proactive position and support a higher likelihood of support.

» Special legal status. In cases where guarantees are not present, Moody's also analyzes whether or not the GRI possesses a special legal status that may prevent it from entering normal bankruptcy proceedings and/or confers some state responsibility for the GRI's debts. For instance, in the case of certain public entities in France that hold the status of an Établissement Public à caractère Industriel et Commercial (EPIC), or of an Ente Público in Spain. Such legal status suggests a higher level of support, as the government may take measures to avoid the uncertain chain of events stemming from a default.

Moody's may consider assigning a GRI rating on par with the rating of its government, absent a formal guarantee from the government. Appendixes II and III provide more detail on GRIs without a BCA, which are rated solely on support (Appendix II) and when to rate at par when the BCA is materially lower (Appendix III).

Ownership

Moody's considers a high level of government ownership as being indicative of potential support. While the ownership level indicates the importance of the GRI to the state, control through other legal means is also considered in Moody's analysis.

» The government's ownership stake. The level of government ownership is one empirical measurement of the GRI's importance to the government. All else being equal, higher levels of ownership indicate that the GRI is more likely to be supported. Moody's may also incorporate ownership stakes held by closely controlled entities. In cases where the GRI is not fully owned by the government, support may be conditional upon the acceptance of other shareholders and/or their willingness to provide additional capital.

» Privatization plans. Plans for privatization, including the motives and any degree of uncertainty surrounding the outcome, may also influence the decision to provide support. Moody's tends to discount the support level of a GRI that has been slated for privatization as such plans suggest that the GRI is of lesser importance to the government. Indeed, GRIs for which there are firm and near-term privatization plans will have their support levels reduced significantly in advance of the actual privatization. Even if privatization plans are uncertain, support may be adjusted downwards to incorporate the reduced likelihood of a bailout over the rating horizon.

Barriers to Support

Legal or policy barriers to support may reduce the likelihood that support will be provided. The focus is usually on European Union (EU) rules prohibiting preferential support to commercial entities, although, in limited cases, non-EU governments or other trading blocs may also be subject to domestic laws or competition commissions that restrict support. In practice, EU members do provide extraordinary financial support to GRIs despite EU rules, which is why we also consider the likelihood that the government would obey barriers, should they exist.

Government Intervention

The tendency of a government to intervene in the economy, whether for ideological, political or socio-economic reasons, may suggest an inclination to support GRIs. This base inclination may then be strengthened or weakened by the nature of connections between the government and the GRI. We assess these factors by looking at past behavior, the attitude of the current government and the connections between the government and the GRI.

» History of state bail-outs. Prior instances of providing or withholding support can provide insight into future decision-making. In general, we view governments that have provided extraordinary support to GRIs or private sector companies in the past as more likely to do so again in future, while those that have allowed GRIs to default have demonstrated indifference. This assessment is generally standardized across all GRIs with the same government owner.

» Ideological and political inclinations. Moody's assesses whether the government is politically or ideologically predisposed towards or against state intervention in the economy. Generally, governments that expound a significant role for the state in the economy are viewed as more likely to support GRIs.

» Government direction of the GRI. Government influence over the GRI's financial condition, through regulation or other similar means, may provide an incentive for support. Indirect control over the GRI's revenues and profits (e.g. through the setting of tariffs) may also create a sense – within government or externally – that the government is responsible for the GRI's welfare.

» Business planning. Government participation in business or funding plans, and/or the appointment of board members may indicate a greater propensity to provide support. The government may be held accountable for the GRI's financial condition if it approved or sponsored the GRI's strategic plans. The appointment of board members may also be perceived as oversight of a GRI. Both suggest ahigher level of potential support.

Political Linkages

Governments may calculate that the political costs of a defaulted GRI are greater than the financial costs of a bailout. As such, even free-market-oriented governments are sometimes incited to support GRIs due to reputation risks. In assessing this dynamic, Moody's analyzes both, the extent to which a default by the GRI would (a) lead to higher borrowing costs for the government and/or related entities and (b) generate political embarrassment given the GRI's proximity to the government and the GRI's status either nationally or internationally.

Economic Importance

Moody's sees a direct relationship between the economic stature of a GRI and the likelihood of support. A high level of economic importance, including trade and financial linkages or a large, politically mobilized workforce may provide an incentive to the government. When assessing this association, however, Moody's is cognizant of the fact that governments can rescue GRIs without preventing a default and that it is often possible for a GRI to continue to operate through a restructuring or bankruptcy process. An important consideration is whether the legal system is likely to give rights to creditors to gain access to assets. While this is likely to improve recovery prospects, it also represents a strong incentive for the government to avoid a default that could imply a loss of ownership of strategic assets.

As part of the analysis of the economic importance of the GRI, Moody's assessments also take into consideration the nature of the service or product provided by the GRI. For instance, a GRI that supplies military equipment may provide a strong incentive for a bailout, especially if the government is worried about the potential outcome of a bankruptcy. Likewise, a GRI without viable competitors, or one that provides an essential public service, may incite the government to provide support if a default would lead to a disruption in these services.

GRI Scorecard

Scorecard Overview

Although rating committees have wide discretion on how best to apply the concepts described within this methodology, analysts may utilize a GRI scorecard as a tool to apply JDA to GRIs. In addition to generating estimates of support and dependence levels based on the factors outlined in the previous two sections, the scorecard also provides guidance on how we layer these estimations on top of the GRI's baseline credit assessment (BCA) and the supporting government's rating in order to come up with a final rating outcome.

Accordingly, the scorecard generates three key reference points: (1) the estimated level of default dependence, (2) the estimated range of extraordinary support and (3) a range of potential rating outcomes taking into account these estimations, alongside the GRI's baseline credit assessment and the supporting government's rating.

Scorecard Estimates of Dependence

As a tool used by analysts to assess the degree of default correlation between a GRI and its supporting government, the scorecard (presented below) estimates dependence levels based on three previously

discussed factors: (1) the extent to which the GRI and government are operationally and financially linked; (2) the extent to which the GRI and government rely on the same revenue base; and (3) the extent to which the GRI and government are exposed to common credit risks.

Within the scorecard, each of the three dependence factors is assigned a level related to the implied correlation of credit risks (low (30%), moderate (50%), high (70%) and very high (90%)). The scorecard then estimates dependence based on the highest level generated by any one of the three factors (given the importance of any one of the three factors in influencing a shared exposure to credit risks). The dependence level generated by the scorecard acts as a reference point for rating committee's decisions in applying JDA to GRIs.

While dependence factors (1) (Operational and Financial Linkages) and (2) (Reliance on Overlapping Revenue Base) are measured and scored using quantitative metrics, factor (3) (Exposure to Common Credit Risks) entails a qualitative assessment of criteria discussed previously (see Exhibit 2 and scorecard example in Exhibits 4 and 5). Factor (1) includes three metrics, covering transfer levels, government purchases and GRI dividends to the governments, which are scored according to dependence levels.[4] For instance, fiscal transfers that represent more than 20% of the GRI's revenues are scored at a 'very high' level. Factor (2) includes one principal metric, covering the extent to which both the supporting government and the GRI rely on the same economic base to generate revenues. For instance, if both the government and the GRI derive more than 95% of their respective revenues from sources within the government's territory, this scores a very high level of dependence.

EXHIBIT 2

Dependence Factors

	Low*	Moderate	High	Very High
(1) Operational and Financial Linkages				
Direct and Indirect Government Transfers as a % of GRI Revenue	0-5%	5-10%	10-20%	>20%
Government Purchases as a % of GRI Revenue	0-5%	5-10%	10-20%	>20%
GRI Payments (Dividends) to Government as a % of Government Revenue	0-5%	5-10%	10-20%	>20%
(2) Reliance on Overlapping Revenue Base				
Percentage of income derived from	Both GRI and	Government and/or	Both GRI and	Both GRI and
within the government's territory	government derive less than 50%	GRI derive more than 50%	government derive more than 75%	government derive more than 95%
(3) Exposure to Common Credit Risks				

Scorecard Estimates of Support

As a tool to assess the probability of extraordinary support, the scorecard generates an estimated support range based on three structural factors – (1) Guarantees, (2) Ownership level and (3) Barriers to support – and three willingness factors: (4) Level of government intervention, (5) Political linkages and (6) Economic importance (see example scorecard on exhibit 5).

Within the scorecard, each of the six factors is assigned a range of support: Low (0% - 30%), Moderate (31% - 50%), Strong (51% - 70%), High (71% - 90%) and Very High (91% - 100%). The scorecard then

[4] In cases where we view the GRI as a clear and visible arm of the government, the Operational and Financial Linkages factor is scored as Very High.

estimates support based on an average of the scores for the six factors, which represents a balanced interpretation of various factors that influence a government's decision to provide or not to provide a bailout.[5] The support range generated by the scorecard acts as a reference point for rating committee.

With the exception of factor (2), which uses data on ownership levels to determine scoring levels (e.g. a government ownership level of 80% scores a high level of support), all of the other five remaining factors are largely qualitative. For these factors, analysts select scores for individual factors that reflect the rationales discussed in previous sections in order to position the support relative to national and international peers.

EXHIBIT 3

Support factor (2)

Ownership

	Low	Moderate	Strong	High	Very High
Ownership Level	0-30%	31-50%	51-70%	71-90%	91-100%

Scorecard Outcome: Rating Range

Once dependence and support have been estimated, the scorecard uses additional JDA inputs, specifically the GRI's assigned baseline credit assessment (BCA) and the supporting government's rating, to generate a range of potential rating outcomes that are a component of the information we consider in assigning ratings to GRIs.

The scorecard's output of a rating range, rather than a specific rating, recognizes that our analytical judgments will consider elements that may not be represented in the scorecard, such as evolving market dynamics and shifts in governments' attitudes toward prioritizing their obligations to direct and contingent creditors relative to other spending needs. The scorecard acts as a tool to ensure that a consistent list of analytical factors are considered. The scorecard provides flexibility to help to ensure that the principal elements that may impact support are considered. However, the scorecard can not anticipate all circumstances and credit considerations, and assigned ratings may be outside the range suggested by the scorecard in some cases.

For example, we may determine that a lower support assumption is appropriate due to sovereign considerations, or, when considering the rating range that is suggested by the scorecard, we may limit the rating uplift provided by support. Such decisions typically include a country-level view of the general ability and willingness of the sovereign to provide support in stress scenarios, as well as our expectations of government support for a particular GRI.

In forming its country-level view on sovereign support constraint, the Sovereign Rating Group may consider that the probability a government will provide support may be lower than indicated by the GRI scorecard when any of the following applies:

» Government ability to support in times of macroeconomic stress or crisis, when a larger number of GRI entities are likely in need of extraordinary support, is constrained by a combination of balance sheet and off-balance sheet pressures, even though willingness may remain strong. Countries with limited fiscal strength are more vulnerable to this point. Important fiscal strength considerations include the sovereign's debt load, debt affordability, debt structure, off-balance sheet liabilities (including the size of contingent liabilities emanating from the GRI sector) and fiscal buffers. Reduced economic or

[5] In cases where there are no legal barriers to support, factor three (barriers to support) is excluded and the average is calculated based on the remaining five factors.

monetary flexibility, for example in highly "dollarized" economies, are other considerations that may indicate a lower capacity to support.

» Moody's ability to assess sovereign support is limited due to lack of transparency and predictability of government policy. Policy predictability and transparency is typically limited in countries with weak institutions, which make it is harder to gauge prospectively the sovereign's reaction to distressed GRIs. Institutional/government effectiveness and rule of law are important considerations.

In order to enhance rating transparency, an example of how the scorecard is applied, based on the case of a hypothetical GRI, is provided below. This example demonstrates how analysts employ the scorecard and provides explanations for the scoring of all the factors behind the assessment of dependence and support, and an interpretation of the rating range output.

Scorecard Limitations

The scorecard offers valuable insights into the key factors that drive rating committee decisions. Nevertheless, the scorecard has limitations since it cannot capture exhaustively all the elements that go into rating decisions. Accordingly, the scorecard is not meant to be a substitute for rating committee judgments, nor is it meant to be a matrix for automatically assigning or changing these assessments.

Cases in Which the Scorecard is Not Meaningful

There may be instances in which we lack sufficient information to determine a rating for the parent of a GRI. If the GRI can be assessed as a standalone entity we may assign a rating based upon the GRI's BCA (significant concerns about credit contagion from the parent would be a likely reason not to assign a rating). Our rating assessment of the GRI will assume zero probability for extraordinary support but will consider any meaningful indirect benefits that are expected to result from the GRI's association with the government, such as lower taxes or preferential access to bank funding and business opportunities subject to government influence.

Scorecard Example: Case of a State-Owned Water Company

This hypothetical example applies JDA – using the aforementioned scorecard as a tool – to a national water company owned by the central government of a small developing country.

Dependence

Operational and Financial Linkages

The operational and financial linkages between the water company and the national government are moderate. Although the company does not pay dividends, government transfers represent 10% of the company's total income and government purchases also represent another 10%.

Reliance on Overlapping Revenue Base

The company and the government rely heavily on the same economic base, implying a very high level of default dependence. Both of them derive nearly 100% of their revenues from within the government's territory.

Exposure to Common Credit Risks

For both the company and the government, exposure to common credit risks is moderate and related to foreign exchange risk. Both rely heavily on cross-border debt issuance and maintain significant unhedged currency exposure.

Overall, these results generate guidance on default dependence at the very high level(90%).

EXHIBIT 4

Dependence	Low	Moderate	High	Very High
(1) Operational and Financial Linkages » Direct and Indirect Government Transfers as a % of GRI Revenue » Government Purchases as a % of GRI Revenue » GRI Payments (Dividends) as a % of Government Revenue		✓		
(2) Reliance on Overlapping Revenue Base » Percentage of income derived from within the government's territory				✓
(3) Exposure to Common Credit Risks » Foreign Exchange Risk in Debt Structure » Shared Industry Exposure » Political Event Risks		✓		
Overall Guidance Dependence Level				✓

Support Guarantees

The central government has told Moody's analysts that it would back the debt of the water company if a default were imminent. Similar comments have also been made by government officials during recent press conferences. Given that the level of public policy transparency and predictability in this country is relatively strong, we view this verbal guarantee as suggesting a high probability of extraordinary support.

Ownership

The central government owns 100% of the water company and does not have any privatization plans, implying a very high probability of extraordinary support.

Barriers to support

There are no legal or policy barriers to support.

Government intervention

In conjunction with a history of state intervention (recent cases when the government provided extraordinary support to national GRIs facing liquidity crises), the government appoints 9 out of 12 board members and is actively involved in establishing and approving GRI business plans. Collectively, these considerations suggest a very high probability of extraordinary support.

Political linkages

The reputation risk of allowing the water company to fail, in conjunction with the increase in public sector borrowing costs that would follow a default by the water company, provide a strong incentive to the central government and implies a very high probability of extraordinary support.

Economic importance

In addition to providing what is considered an essential service in the country (100% of households and 95% of industries rely on the water company for water and sewer services), the GRI employs a fairly large and politically mobilized workforce (4th largest public sector union in the country). These factors support a high probability of extraordinary support.

Overall, these results generate guidance on extraordinary support at the very high range (91% to 100%).

EXHIBIT 5

Support	Low	Moderate	Strong	High	Very High
(1) Guarantees » Explicit Guarantees » Verbal Guarantees and/or Comfort Letters » Special Legal Status				✓	
(2) Ownership » Ownership Level » Privatization Plans					✓
(3) Barriers to Support					
(4) Level of Government Intervention » History of State Bailouts » Ideological and Political Inclinations » Government Direction of GRI » Business Planning					✓
(5) Political Linkages					✓
(6) Economic Importance				✓	
Overall Guidance Support Range					✓

Rating Range

Based on this guidance for dependence and support, alongside the water company's underlying BCA of ba1 and the central government's credit rating of Baa1, the scorecard provides a range of rating outcomes, which is between Baa2 and Baa1.

EXHIBIT 6

Rating Range

GRI BCA: ba1, Government Supporter Rating: Baa1

Support	Low	Moderate	Strong	High	Very High
Dependence	Low	Moderate		High	Very High
Aaa					
Aa1 Aa2 Aa3					
A1 A2 A3					
Baa1 Baa2 Baa3					Baa1 Baa2
Ba1 Ba2 Ba3					
B1 B2 B3					
Caa1 Caa2 Caa3					
Ca C					

Appendix I: Technical Overview of JDA

Conditional Default Probabilities

The probability that two parties will jointly default depends on (a) the probability that one of them defaults, and (b) the probability that the second will default, given that the first has already defaulted. Expressed algebraically, one can write:

$$P(A \text{ and } B) = P(A \mid B) \times P(B) \qquad (1)$$

Or equivalently,

$$P(A \text{ and } B) = P(B \mid A) \times P(A) \qquad (2)$$

We define A as the event "obligor A defaults on its obligations" and B as the event "obligor B defaults on its obligations". Likewise, "A and B" is the joint-default event "obligors A and B both default on their obligations".[6] The operator P(•) represents the probability that event "•" will occur and P(• | *) is defined as the conditional probability of event "•" occurring, given that event "*" has occurred.

Moody's ratings can be used to infer directly the probability that a particular issuer will default (P(A) and P(B)).[7] But in order to estimate the conditional default probabilities P(A | B) and P(B | A), one must take into account the relationship between the drivers of default for both obligors. Each of these four probabilities – P(A), P(B), P(A | B) and P(B | A) – are intended to represent unsupported risk measures. That is, they represent the likelihood of an obligor default in the absence of any joint support or interference.

Although this problem can, in theory, be tackled directly by estimating either one of the conditional default probabilities described in equations (1) and (2), it may be more intuitive to focus on the product of the conditional probability of default for the lower-rated, or supported, firm and the unconditional probability of default for the higher-rated, or supporting, firm. Using L to denote the event "lower-rated obligor L defaults on its obligations" and H to denote "higher-rated obligor H defaults on its obligations," we can rewrite equation (1) as:

$$P(L \text{ and } H) = P(L \mid H) \times P(H) \qquad (3)$$

It is not difficult to imagine situations where the conditional probability P(L | H) might be at its theoretical maximum (i.e. 1) or at its minimum (i.e. P(L)).[8] Let us consider these extreme outcomes in turn by way of example.

P(L | H) = 1. Suppose that the financial health of an issuer is crucially linked to the operations of another, higher-rated entity. For example, the default risk of a distributor in a competitive distribution market dominated by a single supplier may be highly dependent on the financial health of that supplier. In other words, the conditional probability of the distributor's default given a default by the higher-rated supplier,

[6] The implication here is that the default events occur simultaneously, but we require only that the timing be such that a holder of the supported obligation suffers credit loss within a specified horizon.

[7] Moody's ratings are defined as ordinal (or relative) measures of default risk and not in terms of cardinal (or absolute) default rates. However, as long as ratings can provide a constant measure of relative default risk, with actual default probabilities rising and falling proportionately by rating category over a credit cycle, the methods proposed here will produce logically consistent measures of jointly supported ratings.

[8] Technically, the conditional default probability P(L | H) could be as low as zero, a situation which would occur if the default correlation between the two obligors was at its theoretically maximum negative value. However, throughout this discussion, we follow the standard practice of ignoring the highly unlikely possibility that the default experience of the two obligors will be negatively correlated.

P(L | H), is equal to one. In this case, events L and H are maximally correlated.[9] Under such a scenario, the joint default probability P(L and H) in equation (3) above is simply P(H). That is, the rating applied to such jointly supported obligations would equal the supplier's rating, without any ratings uplift, regardless of issuer L's standalone rating.

P(L | H) = P(L). Suppose a highly rated European bank provides a letter of credit to a lower-rated agribusiness in the US. While there may be circumstances in which the agribusiness might face financial difficulties on its own, its intrinsic operational health is generally unrelated to the circumstances that might lead the European bank to default on its obligations. Under this scenario, the conditional probability of a default by the agribusiness, given a default by the bank – i.e., P(L | H) – is simply the standalone default risk P(L) of the agribusiness. That is, events L and H are uncorrelated and independent of one another. In this case, their joint-default probability is the product of their standalone default probabilities, P(L)*P(H). The jointly supported obligation rating implied by such a relationship is generally higher than the rating of the supporting entity H.

In practice, the conditional default risk of the lower-rated entity, given a default by the stronger entity, will vary somewhere between these two extremes, maximum correlation (i.e. where P(L | H) = 1) and independence, (i.e. where P(L | H) = P(L)).

Intermediate Levels of Correlation

We propose here a simple tool for modelling intermediate cases of default risk linkage. Let us denote the variable Was a correlation weighting factor, where W = 1 corresponds to a maximum theoretical correlation between the default of the lower-rated entity and that of the higher-rated entity; and W = 0 corresponds to a complete independence (i.e. zero correlation) between default events. Fractional values of W indicate intermediate levels of correlation between the two default events.

Using the correlation weighting concept, we can express the joint-default probability between obligors L and H as:

P (L and H) =W* P(L and H | W=1) + (1-W)* P(L and H | W=0) (4)

Or more compactly,

P(L and H) = W*P(H) + (1 - W)*P(L)* P(H) (5)

In other words, once we have determined standalone ratings for the two obligors, the task of assigning a rating to a jointly supported obligation may be reduced to the assignment of a correlation weight.

Partial Support

In many cases, an obligation benefits from external support, but that support falls short of an iron-clad guarantee. Examples include bonds issued by a weak subsidiary of a relatively strong parent firm, or bonds issued by an issuer with partial government ownership. In the latter case, the government's incentive to bail the issuer out, should it run into difficulties, may be a function of the share of government ownership or of the importance of that issuer to the national economy.

[9] This use of the term "correlation" applies to default events that follow a binomial distribution and should not be confused with potential correlation in rating transitions (or default intensities). When the default profiles of two obligors are maximally correlated, P(L | H) = 1 and P(H | L) = P(H)/P(L). That is, the weaker entity always defaults when the stronger entity defaults, and the stronger entity will only default if the weaker entity also defaults. This leads to the result P(H | L) = P(H)/P(L). Note that maximum correlation will be less than 1 in cases where obligors have different ratings.

It is helpful to think of the two extreme situations in which an investor faces losses. The first is where the issuer of the obligation defaults and there is no external support. The probability of this event occurring is simply P(L), the probability that issuer L will default on its own. The second is where there is full support, but both the issuer and the support provider default on their obligations. As above, this is given by P(L and H). The degree of support can also be thought of as a probability and can therefore vary between 0 and 1. We model the risk to the investor as a shifting probability between the two risk outcomes P(L) and P(L and H):

$$P(L \text{ and } H \mid S) = (1-S)*P(L)+S*P(L \text{ and } H) \quad (6)$$

Here, the weighting parameter S represents the likelihood of support. Full support (i.e., S = 1) leads to the joint default outcome and no support (i.e., S = 0) yields the standalone default risk of the obligor, P(L).

Appendix II: Analytical Approach for GRIs without a BCA, rated based on support[10]

As noted above, our standard approach to assigning ratings to GRIs is to determine a BCA and then consider uplift for support. BCA analysis provides useful information on fundamental credit factors (e.g. capital adequacy, access to funding, quality of governance) which influence the probability that support is needed. This approach also allows Moody's to more clearly express a view on the likelihood of support being made available and the risks for investors if support does not materialize.

However, in some relatively rare circumstances, we will rate a GRI which is very closely integrated into the public sector at par with or near the level of its government's rating without assigning a standalone BCA, even in the absence of a formal guarantee or similar undertaking. Where material doubts exist over support and integration but it is not possible to derive a meaningful BCA, it is unlikely that Moody's would be prepared to rate the issuer at all.

Characteristics of such GRIs without a BCA, which are rated based solely or primarily on support include:

» A very close and enduring alignment of interest and objectives, often with a clear public policy mandate or license to carry out strictly limited set of public interest functions, generally as a monopoly supplier.

» Some form of special legal status, conferring protections such as a carve-out from normal bankruptcy procedures and/or statutory provisions transferring the GRI's obligations to the government on dissolution, which would make a separate winding up difficult to orchestrate.

» Generally government agencies or entities wholly-owned by the government. While the theoretical ability to privatize (fully or partially) need not rule out an approach focused solely upon support, a meaningful probability of that happening would almost certainly do so.

» Very limited strategic or operational autonomy, with little if any control over its own long-term financial health. All key decisions are ultimately made by the government, for example with government approval needed for operating and capital budgets or for the issuance of debt, with direct government influence exerted through the appointment of board members and management. Frequent and heavy reporting requirements to and oversight by the government.

» Operations and finances are inextricably intertwined with those of the government. The provision of financial or logistical resources under any circumstances would be taken for granted in the normal exercise of government.

» Standalone financial performance and metrics are essentially meaningless, irrelevant to the credit risk its bondholders face, and near impossible to assess on a standalone basis. Changes in 'fundamental' factors – capital, revenues, liquidity, profits – are of little if any analytical interest to the rating – in other words where, no matter how poor the issuer's intrinsic strength or how fast its deterioration, the sole analytical concern is the likelihood of the government providing support.

» The GRI's default would substantially damage the government's own credit standing, and impair its ability to achieve the policy objectives assigned to the GRI. Expectation of extraordinary support is therefore very close to 100%.

[10] The approach described here is distinct from the concept of credit substitution when assessing guarantees. For more details on the credit substitution approach, see our methodology for credit substitution that can be accessed via "Moody's Related Publications" section.

GRI rating will be close to the supporter's, but not always the same

When rating GRI without a BCA, we focus upon support, and start from the assumption that extraordinary support is near certain. However, absent a formal guarantee, certainty of support will never be 100%, so while many such GRIs are rated at the same level as the supporter, we may reflect some degree of uncertainty by rating the GRI one or two notches below the government's rating or in rare cases more than two notches below the sovereign rating.

There are no formulaic rules, and each rating decision reflects rating committees' judgment about the particular circumstances. Rating committees consider what would happen were both the government and the GRI to face severe financial distress, the priority the government would ascribe to supporting the GRI, whether providing support to the GRI would exacerbate or potentially lessen the stress on the government, how essential the activities of the GRI would be to the post-failure recovery of the government and whether the GRI's activities would be impaired by a default or could be performed by private market entities.

Put simply, the key question for each rating committee is whether there is any material probability that the government might choose to prioritize its own debt obligations in circumstances in which it was itself facing serious difficulties meeting those obligations.

Even a small amount of uncertainty can justify notching

The expectation of extraordinary support does not need to fall far short of 100% for notching to be appropriate. For example if an issuer did have a BCA, with its intrinsic strength consistent with a Caa1 rating, to lift its rating to the same as its A1-rated government would require 100% probability of support. We may perceive certainty approaching that level where issuers are very highly integrated into the government.

However, any sense that support is less certain would quickly imply a lower rating for this issuer: a 99.5% probability of timely support would imply a rating of A2, 99% A3, and 98% Baa1. The judgments involved are very fine and common sense is required, but the additional uncertainty required to justify a two or three notch gap is not great. Even if those sensitivities will reduce somewhat where the intrinsic strength of the GRI and the government's rating are closer together, the key point is that an exceptionally high degree of certainty of support is required to lift a GRI to the same rating as the government, and that only very small increments in uncertainty are needed to imply lower ratings for the GRI.

Overall, notching for such a GRI would only very rarely exceed two notches; either an issuer is sufficiently closely and enduringly linked to the government to justify this approach – in which case linkage will by definition be close – or it is not. So once a rating committee has chosen an approach focusing solely upon support, the next step will be to determine whether to rate at par, or lower – usually by no more than one or two notches.

Characteristics of GRIs without a BCA, which are rated based on support and are equalized with or notched from their government's rating

A GRI's rating would only be equalized with that of its government where at least some of the following conditions are met; where they are not, the GRI's rating will likely be notched below the government's rating.

» It is currently extremely unlikely that the government would prioritize repayment of its own debt over and above that of the GRI: the government should be expected to treat the GRI's debt pari passu with its own in all circumstances. While not essential, very recent instances of extraordinary support provide the clearest indication of willingness and capacity to support.

  The government's institutional and fiscal strengths are both very strong and the government has provided strong assurances that a GRI's credit quality is almost indivisible from its own. Where a

government's credit quality is weaker (A-range and below) or subject to a combination of large off-balance-sheet liabilities and macroeconomic stress, the risk of prioritization is at least fractionally higher, so the GRI's rating is more likely to be notched.

» The government would suffer extremely high reputational damage were the GRI to default, which would undermine market confidence in the government very severely. This will most likely be the case where the GRI is widely perceived as being a public policy arm of the government with all key decisions about strategy, operating budgets and debt issuance being made by the government, or where senior officials have recently made clear policy commitments to provide support where needed. At higher rating levels, capacity to support will be undoubted and reputational damage would likely be disproportionate; so par ratings for GRIs are more likely. Whereas at lower rating levels or where a reputation has already been damaged, prioritization may be introduced by the government as a deliberate and positive policy tool to start to rebuild both reputation and credit quality; so the GRI's rating is more likely to be rated below the government.

» Legislation requires the government to provide extraordinary support even in the absence of an explicit guarantee. Those requirements will most likely complement clearly-worded letters of comfort (which would, alone, rarely justify rating at par).

» The GRI either controls essential assets that the government would not allow to fall under the control of creditors and would not conceivably privatize, or it performs a vital role that is important for the functioning of the economy and could not be provided by the private sector at an acceptable cost, and default would materially interfere with the GRI's activities. This would most likely be the case for critical national infrastructure such as railways and national defense contractors, or for financial institutions that play a key role in channeling funding to critical parts of the public sector or economy.

One further possible condition – 100% ownership by the government – is often associated with the very high credit integration required for rating at par, but is more of a necessary than sufficient indicator for a par rating.

In practice, when the above mentioned conditions are met and the government is rated Aaa or Aa, we observe that such GRIs are more likely to be rated at par; when the government is Baa or below, notching is more frequent. The vast majority of GRIs without a BCA, which are rated based solely or primarily on support, are rated at par; very few are rated more than one notch from their government.

Appendix III: When to Rate a GRI at Par with the Government if BCA is Materially Lower or There is no BCA

Under some circumstances, Moody's may consider lifting a GRI rating many notches from the BCA to be at par with the rating of its government, or rating a GRI without a BCA at par with the government even when the GRI does not benefit from a "blanket" guarantee from its government; however, caution is warranted, because an at-par rating assumes a nearly 100% probability of support.

Although there may be exceptions, GRIs most suited for a par rating will display common characteristics which we take into account when deciding to assign a rating at, or near, that of the relevant government. They typically benefit from a special legal status, reflecting the strategic importance of their role and offering forms of protection such as a carve-out from normal bankruptcy procedures, a pledge of financial resources including through capital replenishment, backstopping of operating losses or legal provisions transferring GRI debt obligations to the government upon dissolution. Explicit government guarantees on some of the debt issued by a GRI are also taken into account when considering the option of assigning the government rating at the issuer level and to non-guaranteed debt, once the decision of the government to guarantee some debt obligations but not others is well understood and does not suggest that government has decided to differentiate its support for the various classes of debt. The presence of cross-default provisions in the guaranteed debt is also considered, as it may increase the government's incentive to support unguaranteed debt instruments.

Given the transition risks in such cases, any changes in status stemming from shifts in government policies and priorities or international treaties that may drive or reflect a change in the government's willingness and/or ability to intervene are very important signals about the probability of future support. Similarly, increasingly large international activities at a GRI, in contrast to a core domestic policy role, could affect a government's propensity to support or encourage a more selective approach.

As noted above, where the government is very strong in terms of its institutions, predictability and fiscal profile and it has provided strong assurances that a GRI's credit quality is almost indivisible from its own, the GRI is more likely to be rated on par with the government.

Appendix IV: Multiple Government Owners

When a GRI is owned by more than one government, our general approach is to estimate support on the assumption that the owner with the largest share will have the most to gain from supporting the GRI. If the government owner with the largest share does not or cannot provide support, then there is significantly less incentive and therefore propensity for other government owners to do so. However, where two or more governments have significant and similar shareholdings, then the support burden may be shared and how we apply JDA is adjusted.

Multi-government ownership cases would generally be dealt with in the following way:

» If there is one majority government owner of the GRI, or one government has a significantly higher shareholding than any other government, that significant owner is considered the sole supporter for the purposes of the GRI Rating Methodology.

» Governments that own less than 20% are typically not included in our support analysis.

» In cases where two or more governments have shareholdings of between 50% and 20% (but there is no dominant shareholder), an "average" supporter assumption is made. More specifically, (i) the GRI's ownership % is deemed to be the arithmetic mean of the % shareholdings of all the relevant shareholders, and (ii) the government's rating is deemed to be the weighted average rating of the relevant shareholders.

» Where ownership is widely shared across a larger number of governmental parties (e.g. municipalities), we might still consider using their aggregated percentage shareholding if there is clear history or evidence to suggest they would act in concert together on a timely and effective basis, perhaps because they themselves are bound by joint-and-several liability. However in some cases it is unclear how multiple parties would in practice reach timely agreement on support actions, causing us to attribute a very low likelihood of support or to determine that the issuer should not be classified as a GRI.

Appendix V: Rating hybrids and other junior instruments issued by GRIs

Our approach for GRIs with hybrids and other junior instruments (collectively, "junior instruments") recognizes that in providing extraordinary support to a GRI's senior debt, the government may incidentally also support the junior instruments.

The starting point for rating junior instruments issued by a GRI is normally its BCA. We make notching decisions from the BCA using the guidance described in our cross-sector methodology for notching bonds, preferred stocks and hybrid securities of corporate issuers,[11] or guidance found in the relevant sector methodology. We then consider the amount of uplift that is appropriate to each instrument issued by the GRI (e.g., senior unsecured, senior subordinated, junior subordinated) based upon our estimate of the level of extraordinary support from the government for that instrument. In general, there is likely to be a greater differential in the expected level of extraordinary support among instrument types for issuers in regulated sectors, where the regulator has an ability to impose losses prior to default.[12]

Since governments own equity stakes in GRIs, support will often take a form which restores the viability of the entity as a whole (not just the senior debt), supporting the value of the government's equity stake. Where hybrids represent only a modest element of the GRI's overall capital structure, the expectation is that in most cases, support measures that are sufficient to shield senior debt from default will also be sufficient to shield hybrids to some extent, not necessarily the same extent. Thus, in the vast majority of cases, our estimate of extraordinary support is somewhat less for hybrid instruments of a GRI than for senior debt of the same issuer. As a result, and due to the downward notching typically applied to hybrids based on their subordination and other contractual terms, the ratings of a GRI's hybrid securities are usually below the BCA that is the starting point for our analysis.

However, under unusual circumstances where we view a government owner as being exceptionally likely to provide extraordinary support in ways that do not meaningfully distinguish between senior debt and junior instruments, we may attribute the same level of support to both. In such cases, the hybrid debt could be rated at or above the BCA that is the starting point for our analysis and could be rated as high as 1-2 notches below the senior unsecured debt. The rating differential between the two classes of debt in this case would reflect the lower expected recovery on the hybrid, and, for securities with features that lead to impairment ahead of a more general default of the issuer, it could also reflect higher probability of default.

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

[12] Note that in the case of junior capital issued by GRIs that are banks, notching is based on the loss given failure and additional notching frameworks described in our methodology for banks. A link to our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

Appendix VI: Rating Public Pension Funds

This appendix provides supplementary information for the analytical considerations that are most important in our ratings of public pensions and pension managers (collectively, public pension funds), which are a sub-set of GRIs rated primarily based on support, and we typically do not assign a Baseline Credit Assessment (BCA). These issuers administer public sector defined benefit pension plans, and the plan sponsor/supporters are sovereigns or sub-sovereigns. Our approach applies to entities that manage investments and administer and pay the underlying pension benefit obligations and to entities that only manage assets to support an underlying obligation held by a sovereign or sub-sovereign. Public pension fund ratings are not typically assigned to the obligation to pay the pension benefit, but instead to debt, guarantees or general obligations (for instance under hedging agreements) that public pension funds enter into as part of their asset management activities.

As described in more detail below, the starting point of our approach for rating public pension funds is typically the sponsor/supporter's long term issuer rating. In cases where there is a clear and sustainable priority of claim for rated obligations over its obligations to make pension payments,[13] the public pension fund may be rated above the sponsor/supporter. The upward notching is limited to three notches above the sponsor/supporter and based on the size of the layer of subordinated claims lying below the rated claim. Some weaknesses in qualitative considerations such as the legal framework, pension funding flexibility, governance and political independence may negatively impact the public pension fund rating with no limitation to the resultant downward notching.

Key Rating Considerations

Public pension funds are entities that are often very closely integrated into public sector operations and finances or have a close and enduring alignment of interests and objectives. The starting point for our ratings is typically the sponsor/supporter's long-term issuer rating (which typically corresponds to its senior unsecured rating). In many cases, the link between the sponsor rating and the pension fund rating is very strong, due to the alignment of interests, and because the monies that are deposited into the fund are raised from the same economic base that underpins the sponsor(s)' other revenues. Even when public pensions are fully funded relative to the net present value of their future obligations to current employees and retirees,[14] sponsors will need to provide additional monies over time to fund obligations related to future service for current and future employees, and to backfill any subsequent investment losses.

The link is typically strongest when the sponsor/supporter is highly rated and default is remote, because the relative circumstances of the sponsor/supporter and public pension fund at default are extremely difficult to predict. In these situations, we typically consider how the legal priority of claim affects the credit risk of the public pension fund's rated obligations relative to the sponsor/supporter's rating (which may be an upward or downward adjustment), and then consider various other factors relating to the public pension fund's standalone financial strength, management track record, and independence from the sponsor/supporter. These other factors may lead to downward adjustments relative to where the rating would be considering only the sponsor/supporter's rating and the priority of claim. Even in cases where there is ratings uplift based on an expectation of higher recoveries due to legal priority of claim, such downward adjustments may partially or fully offset such uplift, and they may lead to a public pension fund rating that is lower than the sponsor's rating.

[13] See the "Priority of Claim" section for more details.

[14] Actuarial assumptions can vary widely, including with respect to future pension obligations, discount rates and future rates of investment return. We may use different assumptions than those reported by the pension plan.

As the ratings of sponsor/supporters and public pension funds move down the rating scale, it may be possible to distinguish their relative default probabilities or expected relative recoveries in a more meaningful way. 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 pensioners, general obligation debt service, debt service of the pension fund, funding for general governmental services, etc.). The sub-sovereign's prioritization may affect relative default probabilities and expected recoveries. In these cases, we would continue to consider how legal priority of claim would affect expected recoveries.

In the sections below, we discuss certain sector-specific considerations that inform the placement of the pension fund's rating above or below the sponsor/supporter's rating. We note that the same broad rating factors that apply to all GRIs, including support and dependence, also apply to public pension funds, and the principles discussed in Appendices II, III and IV are useful in considering the placement of a public pension fund's rating relative to its sponsor/supporter.

Priority of Claim

The priority of claim of a public pension fund's rated obligations (typically, its debt, but potentially also its counterparty risk liabilities[15]) relative to its other obligations (typically, payments to pensioners) 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.

Our view of the priority of the public pension fund's rated obligations to its obligations to make pension payments would typically be informed by stated legal priority, while also taking into account precedent and our expectations of how governments may act to favor pensioners or creditors in a stress scenario. Even when a public pension fund's debt obligations and pension payment obligations are pari passu, we may consider that the sponsor will prioritize the payment of pension obligations over the public pension fund's debt.

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 to have meaningful ratings impact.

Clear, sustainable priority of claim is a pre-requisite for rating a public pension fund above its sponsor/supporter, except where the sponsor/supporter has relatively low ratings or is undergoing stress, and there is clear indication that likelihood of default for the public pension fund is meaningfully lower than for the sponsor/supporter.

When priority of claim for rated obligations is clear and sustainable, the upward lift relative to the sponsor/supporter's rating depends on the size of the layer of subordinated claims lying below the rated

[15] We may assign a Counterparty Risk Rating (CRR) to a public pension fund. 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 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.

claim. A public pension fund can be rated up to three notches above the sponsor/supporter's issuer rating based on our estimation of the enduring layer of subordinated claims that will continue to lie underneath the rated senior claims. This estimation is principally based on the ratio of the public pension fund's senior obligations to total assets, which may be adjusted based the fund's investment strategies and debt management, or based on trend analysis. In calculating the ratio, we incorporate applicable adjustments described in our cross-sector rating methodology that discusses financial statement adjustments in the analysis of financial institutions.[16] We may make additional adjustments where warranted, for instance to reflect specific provisions in the public pension fund's counterparty netting agreements.

We consider a one notch uplift where there is a maximum ratio of senior obligations to total assets of 50% on a sustainable, forward-looking basis and a second notch of uplift where the maximum ratio is 25%. We may also consider a third upward notch where the maximum ratio is 10% and we have a very high degree of confidence that the ratio will remain at or below 10% for the foreseeable future.

As the sovereign generally holds control over the legal framework, rating above a sponsor anchor would be limited to cases where the sponsor is a sub-sovereign, and the public pension fund's rating would ultimately be constrained by the sovereign rating.

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 de facto treatment in default will be pari passu, there would usually be no upward or downward notching from the sponsor/supporter's rating based on priority of claim. In cases where the legal priority of claim of rated obligations is subordinate to other obligations (especially pension fund payments, since they usually represent the bulk of liabilities) or where we view the de facto priority as subordinate, rated obligations will generally be multiple notches below the sponsor/supporter's rating.

In the following sections, we outline some considerations that may lead to downward adjustments relative to where the public pension fund's rating would be considering only the sponsor/supporter's rating and the priority of claim.

Legal Framework

The legal status of the public pension fund vis à vis the pension obligations and the sponsor(s) is an important consideration; we may also consider how political and practical considerations could affect the respective responsibilities of the pension fund and the sponsor. We would typically consider the extent (if any) to which the public pension fund itself is legally obligated to make defined benefit payments, or whether its obligations are more circumscribed; for instance if the public pension fund is more purely an asset manager whose obligation is simply to return assets to the sponsor or plan members/pensioners to the extent such assets are available, in order to assist the sponsor in meeting the sponsor's pension obligations. A framework that is unclear, is evolving, or expected to evolve could weigh negatively on the public pension fund's credit profile.

Pension Funding Flexibility

Public pension funds generally hold a very large and highly diversified portfolio of securities and other investments that may be relatively uncorrelated to the strength of the regional economy of the sponsor (especially a sub-sovereign sponsor). Where pension funds hold assets that either carry a higher risk of material loss for the fund in a stress scenario (e.g., sector concentration, material assets located in the pension fund's jurisdiction) or that may not be readily available to cover payment obligations, this would

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

weigh negatively on a pension fund's flexibility and its credit profile, potentially leading to downward notching.

Plan funding status is also important. The presence of sustained under-funding is a negative factor because it can be an indication of a weak commitment by the sponsor/supporter or a weak capacity of the pension fund/manager to meet future obligations. We typically view over-funding of a pension as a relatively temporary phenomenon that would likely be reduced over time by lower pension contributions, especially if the pension fund sponsor were undergoing economic stress. However, chronic pension under-funding during periods of economic stability raises doubts that a sponsor/supporter would have the capacity and willingness to provide extraordinary support to a public pension fund, should it be needed. Similarly, a weak capacity of the fund administrators to impose plan funding changes on the sponsor (such as contribution increases or benefit reductions) to meet growing obligations or if there is a shortfall in expected returns, would signal a limited funding flexibility.

Other important characteristics of the pension benefit liability that may affect negatively a pension funding flexibility include unfavorable plan demographics, in particular the average duration of the pension benefit obligation, the proportion of active to retired members and the plan's discount rate. Useful comparisons for the latter may include the fund's long-run average return (historical and expected), the jurisdiction's risk-free rate (typically, the sovereign or in some cases the sub-sovereign bond yield) or market interest rates reflecting the risk of pension benefits, and the discount rates used by any comparable peers.

Governance & Political Independence

Corporate governance, as promoted by the public pension fund's board of directors, is a contributor to the financial health and credit profile of a public pension fund. Corporate governance is typically assessed based on the board's independence, expertise and involvement, as well as in its ability to align governance practices with proper oversight of the management team and strategy. Where a public pension funds demonstrates some weaknesses in its governance, this may weigh on the rating.

We may also assess the interests, motivations, track record, and resources of public pension fund's sovereign or sub-sovereign sponsor/supporter in order to anticipate how the sponsor/supporter might behave in the normal course of events and at times of stress. The potentially conflicting interests of sponsors, creditors, and plan members may also be of importance in projecting how the board and management team may act to balance these demands.

We typically consider the extent to which the public pension fund's strategy, portfolio composition and operations remain independent of political considerations affecting the sponsors (e.g. impacts on taxes and revenue base, relationships with employees or unions), versus situations where political considerations have impacts on pension contributions, pension benefits, investment decisions, or actuarial assumptions and measurements in order to satisfy specific interest groups. Political interference typically raises the risk that a public pension's decisions become misaligned to the interests of its creditors, a negative factor that can lead to downward notching.

Jointly Sponsored Public Pension Funds

For jointly-sponsored public pension funds, we determine an aggregate supporter credit profile as the starting point for the public pension fund's rating, based on the sponsors' respective credit profiles, the distribution of their commitments and credit profiles (e.g. similar versus disparate credit profiles, large number of sponsors with relatively similar commitments versus concentration in certain sponsors) the legal nature of their commitments, and the relationship of the sponsors to each other (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 in interest in supporting the municipalities).

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.

» 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 credit 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 credit 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 would typically use a rating that approximates the weighted average of the sponsors' credit ratings as the aggregate credit supporter credit profile, provided the ratings are not too disparate. In cases of material concentration in weaker sponsors, we may consider that the aggregate credit 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.

Use of a BCA for Public Pension Funds

While we typically rate public pension funds without consideration of their stand-alone credit quality as reflected through a BCA, there may be circumstances where the stand-alone credit quality of a public pension fund becomes relevant to our analysis. Under such circumstances we may perform additional analysis to assess the stand-alone probability of default of the pension fund and assign a BCA. In particular, stand-alone analysis of a public pension fund may be relevant where the credit risk of the sponsor increases to a level where we believe its default probability and/or loss given default probability materially exceed(s) that of the public pension fund on a stand-alone basis. If we assign a BCA, any government support would be incorporated via our JDA approach. Further, the notching for LGD could vary as greater clarity arises on the relative credit risk.

If we were to assign a BCA, we would use an appropriate published credit rating methodology. Selection of the methodology for the BCA would depend on the business model of a pension fund, as a manager of pension assets on behalf of the plan sponsor or a pension fund (which may be a trust structure) with exposure to both asset investment risk and pension plan liability risk. As for most other types of issuers, when a public pension fund has a hybrid business model, guidance from other credit rating methodologies, in addition to the primary methodology, may be considered in assigning the BCA. The credit quality of a public pension plan's sponsor would still be an important consideration in assigning a BCA. Linkage to the sponsor, for example via sponsor funding obligations to the plan or investments in securities issued by the sponsor, may constrain how far above the sponsor's credit rating a BCA could be positioned.

Moody's Related Publications

Credit ratings are primarily determined by sector credit rating methodologies. Certain broad methodological considerations (described in one or more cross-sector rating methodologies) may also be relevant to the determination of credit ratings of issuers and instruments. An index of sector and cross-sector credit rating methodologies can be found here.

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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