MOODY'S
INVESTORS SERVICE

SECTOR IN-DEPTH
4 May 2023

TABLE OF CONTENTS

Summary 1
Weakest issuers are most vulnerable to heightened market uncertainty between now and X-date 2
A wider range of public finance issuers would be affected if the X-date passes without a deal but the government opts to prioritize interest payments 3
A missed interest payment and sovereign rating downgrade would affect a wide range of sectors 4

Analyst Contacts

Claire Li +1.212.553.3780
VP-Senior Analyst/CSR
claire.li@moodys.com

Elena H Duggar +1.212.553.1911
Managing Director-Credit Strategy
elena.duggar@moodys.com

William Foster +1.212.553.4741
VP-Sr Credit Officer
william.foster@moodys.com

Nicholas Samuels +1.212.553.7121
Senior Vice President
nicholas.samuels@moodys.com

Atsi Sheth +1.212.553.7825
MD-Global Head of Credit Strategy & Research
atsi.sheth@moodys.com

Anne Van Praagh +1.212.553.3744
MD-Gbl Sovereign Risk
anne.vanpraagh@moodys.com

Political risks – US

Scenario analysis: US debt-limit standoff elevates credit risk for various debt issuers

Summary

Treasury Secretary Janet Yellen's recent letter to Congress suggests that the so-called X-date, when the US (Aaa stable) exhausts extraordinary measures and cash buffer to meet the debt limit, may come as early as 1 June. This has heightened market concerns around the negotiations. Our baseline expectation is that, despite the fractious political environment, US lawmakers will ultimately raise or suspend the debt limit before the X-date. But the uncertainty itself is raising credit risks. In this report, we outline the credit implications of three different scenarios: the first where the limit is raised or suspended before the X-date; the second where the debt limit is not lifted, but the government prioritizes interest payments and does not default; and the third, which we consider highly unlikely, where the government misses an interest payment.

- **Lowest-rated issuers are most vulnerable to heightened market uncertainty between now and the X-date.** Given current political dynamics, the decision to lift or suspend the debt limit is likely to be made very close to the X-date. This will intensify volatility in financial markets and increase funding costs and credit risk, particularly for low-rated issuers. If the government is eventually forced to concede major spending cuts in budget negotiations later this year to avoid a fiscal cliff, a wider number of debt issuers could be affected, though the specifics of any policy decisions will determine the intensity for individual issuers.

- **A range of public-finance issuers would be affected if the X-date passes without a deal and the government opts to prioritize interest payments.** A decision to prioritize interest payments may not affect the US sovereign credit profile as it would continue to meet its debt obligations. But it could generate credit pressures for a number of public-finance issuers reliant or exposed to federal funding. The impact would depend on how long government funding is disrupted, the issuer's reliance on the government funding, and any offsetting credit strengths.

- **A missed interest payment and sovereign rating downgrade would affect a wide range of sectors.** The ratings of debt issuers directly linked to the sovereign rating would likely move in lockstep. Issuers whose ratings incorporate uplift based upon assumptions of government support and those who receive substantial federal transfers, or have outsized dependence on federal employment or federal procurement spending, are the most exposed. For other issuers that have indirect linkages, the credit effects would vary with their degree of exposure to the US sovereign and offsetting credit strengths.

Weakest issuers are most vulnerable to heightened market uncertainty between now and X-date

On 19 January 2023, the US government reached its statutory debt limit of $31.4 trillion. Since then, the Treasury Department has been using "extraordinary measures," – a series of temporary accounting measures to increase borrowing capacity under the debt limit – to meet its daily financing needs. In January, Treasury Secretary Yellen notified Congress that the Treasury is unlikely to exhaust its extraordinary measures and cash buffer before early June. On 1 May, after reviewing recent federal tax receipts, Yellen again warned that the Treasury will be unable to continue to satisfy all of the government's obligations by early June, and potentially as early as 1 June if Congress does not raise or suspend the debt limit before that time.

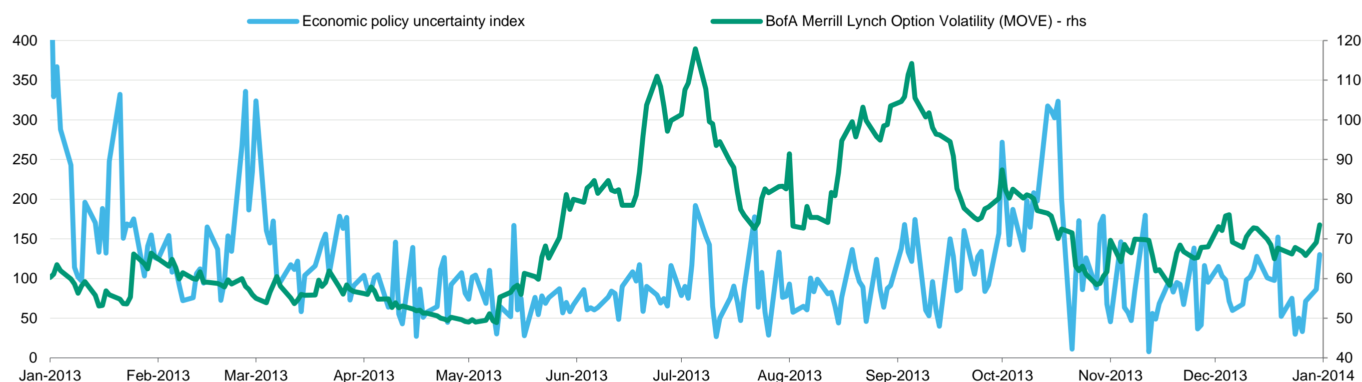
We expect an agreement on raising or suspending the debt limit will be reached before the X-date. However, a fractious political environment continues to point to the possibility of an extended and disruptive impasse. We expect negotiations to be highly politically polarized and drawn out close to the X-date, which will further intensify volatility in financial markets akin to what was seen in previous debt limit episodes (Exhibit 1). Heightened volatility in the context of a weaker macro environment, rising funding costs and falling consumer, business and investor confidence would add to credit risk across the board, but particularly among the weakest credits.

The suspension of the sale of State and Local Government Series Securities (SLGS) from 2 May will help the Treasury manage the debt subject to the limit, but could be negative for some state and local governments and other municipal borrowers that use SLGS to refund escrows. That said, year-to-date tax-exempt advanced refunding has not been permitted since 2017.

Exhibit 1

Heightened market volatility during 2013 debt limit episode

Economic Uncertainty Index and BofA Merrill Lynch Option Volatility Index (MOVE)



Sources: Haver Analytics and Moody's Investors Service

Disagreement between US lawmakers over budgetary spending cuts is at the heart of the political impasse over the debt limit. The Limit, Save, Grow Act of 2023 passed the House on 26 April. The House Republican's plan aims to increase the debt limit by $1.5 trillion, or suspend the debt limit until 31 March 2024, whichever occurs first, in exchange for spending cuts. Republicans intended for the bill to spark budget negotiations with President Biden and the Democrats. Nonetheless, the Limit, Save, Grow Act – which rescinds unspent COVID relief funds, repeals most of the Inflation Reduction Act's (IRA) energy and climate tax credit expansions and prevents implementation of President Biden's student debt cancellation among other things – is very unlikely to pass the Democratic-controlled Senate. At the moment, Democratic leaders are not willing to negotiate the federal budget along with the debt limit, while Republican leadership in the House maintains that the chamber will not pass a bill to raise or suspend the debt limit without budgetary spending cuts.

We expect Congress to pass a series of small extensions that push the X-date back until the end of the fiscal year, to align it with the annual budgetary appropriations negotiations. The convergence of two separate but intertwined issues could seriously complicate both

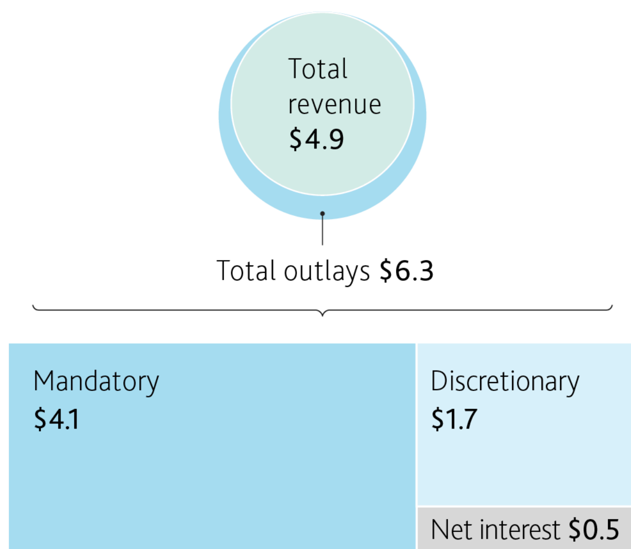
This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the issuer/deal page on https://ratings.moodys.com for the most updated credit rating action information and rating history.

negotiations and sets the stage for a dangerous fiscal cliff reminiscent of the brinkmanship in 2011 that ultimately resulted in forced spending cuts. Should that recur, reductions in non-defense discretionary government spending and entitlement program reforms will likely have negative credit effects on public finance debt issuers. The credit implications for individual issuers would depend on the specific changes in federal spending policies that are agreed upon.

If fiscal year 2024 appropriations are not approved or extended through a continuing resolution, a temporary government shutdown is possible. This would halt federal discretionary spending that accounts for nearly 30% of total non-interest federal spending as of fiscal year 2022 and includes most day-to-day government operations (Exhibit 2 and 3). Although it would not have any immediate implications for the US government's credit rating, a shutdown would negatively impact entities that rely on federal funding for revenue or debt servicing payments, and entities with heavy exposure to the Washington, D.C. economy.

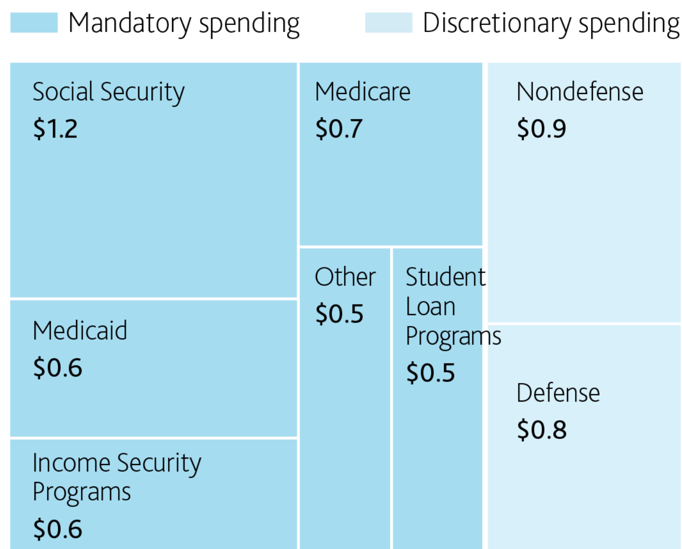
Should this matter become further entangled and politicized in the run-up to the next presidential election, it would likely result in an unprecedented surge in market noise. Such as scenario would undoubtedly prolong the period of market volatility, potentially leading to increased uncertainty and unease among investors.

Exhibit 2
The federal deficit was $1.4 trillion in fiscal year 2022
FY 2022 government spending and revenue, in trillion US$



Sources: Congressional Budget Office and Moody's Investors Service

Exhibit 3
Discretionary spending accounts for more than a quarter of non-interest federal spending
FY 2022 federal expenditure by category, in trillion US$



Sources: Congressional Budget Office and Moody's Investors Service

A wider range of public finance issuers would be affected if the X-date passes without a deal but the government opts to prioritize interest payments

If Congress fails to act and the debt limit is not resolved, the Treasury would likely prioritize interest payments over other expenses in order to preserve the full faith and credit of the US government and avoid significant disruptions to the global financial markets. However, such an approach is unprecedented and its effectiveness is not guaranteed.

Even if the government continued to meet its debt obligations and there were no direct implications for the US sovereign rating, the credit impacts of any disruption to federal funding could be severe. Downstream **US public finance issuers** that are reliant on or exposed to federal payments would be particularly negatively affected. If the debt limit isn't adjusted, certain payments from the federal government to veterans, social security beneficiaries, Supplemental Nutrition Assistance Program (SNAP) recipients and reimbursements to state governments through the Medicaid or Medicare programs could be delayed. The longer the duration of such postponed spending, the more significant the negative impact on debt issuers, the economy and the broader financial markets.

For example, disruption in the flow of Medicare payments, which typically account for over 40% of hospital patient service revenue, would cause significant stress to **not-for-profit hospitals**, especially the ones with limited liquidity or on the lower end of the rating spectrum. Though median days of cash on hand for the sector still exceed 200 days, a brief spell without federal funding would cause significant stress for many hospitals. Once the working capital funds are depleted, hospitals would have to resort to drawing on credit lines or selling off investments in order to raise cash. Medicaid, which is jointly funded by the federal government and states, could also be forced to curtail payments to **hospitals and other providers**, further stressing cash flow.

Public finance housing sectors also face varying degree of exposure to the impact of prioritizing interest payments over other expenses. **Public Housing Authorities (PHAs)**, **Section 8 projects**, and **military housing** are the most exposed, relying on federal capital fund appropriations, Section 8 rental subsidy payments from Department of Housing and Urban Development (HUD), and rental revenue from the Department of Defense (DOD), respectively. However, these projects typically have Maximum Annual Debt Service Reserve (MADS) that can be tapped to mitigate the impact of delayed payments.

State housing finance agencies and **standalone housing deals** secured by Federal Housing Administration (FHA) insurance or Ginnie Mae (GNMA) are less exposed, as guarantor payments are funded from their own reserves and are not subject to appropriations. Standalone transactions insured by FHA or FHA risk-sharing insurance have 6 to 8 months' debt service reserves to address any delayed payments. During past debt-limit crises and government shutdowns, GNMA has committed to pay principal and interest, further reducing the vulnerability of standalone housing deals. Overall, while public housing sectors may face disruption, the combination of reserve funds, over-collateralization, and access to other resources suggest that the impact is likely to be limited.

In addition, there are a number of **non-financial corporate sector issuers** that would be vulnerable to a prolonged disruption in the availability of government funds. Many for-profit hospitals and healthcare providers also rely on Medicare and Medicaid funding. Healthcare REITS with skilled nursing facilities would be highly vulnerable. Government contractors, aerospace, and defense companies will face a liquidity squeeze if the government delays paying its bills.

A missed interest payment and sovereign rating downgrade would affect a wide range of sectors

We would classify a missed interest payment as an event of default**,** which would result in a downgrade of the US sovereign rating. A wide range of US debt issuers including financial institutions, nonfinancial corporations, sub-sovereign, and not-for-profit entities would be affected by a sovereign rating downgrade, depending on the extent of their economic or financial exposure to the sovereign (Exhibit 4).

Exhibit 4
How sovereign credit quality affects other issuers

HOW SOVEREIGN CREDIT QUALITY AFFECTS OTHER ISSUERS

	Direct credit linkages	Indirect credit linkages
Generally includes	• Issuers whose rating are based on a sovereign guarantee or credit enhancement • Government related issuers whose ratings are based solely or primarily on government support • Transactions collateralized or secured by US Treasury securities or by government agency obligations	• Credits with substantial asset exposure to sovereign securities or sovereign linked-entities • Issuers whose ratings incorporate uplift based upon assumptions of government support • Credits that receive substantial federal transfers or have outsized dependence on federal employment or federal procurement spending
Impact	• Credits would generally move in tandem with the government bond rating	• Implications for credit quality would vary by degree of exposure to the US sovereign and offsetting credit strengths
Examples	• Government-sponsored enterprises such as Fannie Mae and Freddie Mac • Pre-refunded bonds secured by escrowed US government and agency securities	• US banks and insurers, money market and bond funds • State and local governments

Source: Moody's Investors Service

Debt issuers with ratings directly linked to the sovereign rating

Ratings of debt issuers directly linked to the sovereign rating would likely move in lockstep with a sovereign rating action. These include **ratings based upon a guarantee or other credit enhancement by the US government**, and **structured transactions for which collateral consists primarily of securities issued by the federal government or directly linked entities**. Such issuers are generally positioned at or slightly below the sovereign bond rating level.

For example, **bonds issued by foreign governments under the full faith and credit guarantees of the US government** are directly linked to the sovereign. As a result, any rating action on the issuer rating of the US government would be mirrored by actions on the ratings of these bonds. For example, the US government issues guarantees on certain bonds issued by the Government of Israel (issuer rating A1 stable, certain bonds with backed senior unsecured rating Aaa).

Government-sponsored enterprises (GSE) such as Fannie Mae (Aaa stable), Freddie Mac (Aaa stable), Federal Farm Credit Banks (Aaa stable) and Federal Home Loan Banks (Aaa stable) have a material amount of government support incorporated in their ratings. As a result, their ratings would likely move in tandem with the US government's.

US public finance entities with direct links to the US sovereign typically benefit from an explicit guarantee, credit enhancement, or high levels of support from the federal government or a GSE. They are either the same as that of the US government or are explicitly notched off the US sovereign rating. Examples include pre-refunded bonds that are secured by escrowed US government and agency securities and federal lease financings. Directly linked credits also include standalone housing revenue bonds secured by mortgage-backed securities with credit enhancement provided by Fannie Mae, Freddie Mac, Ginnie Mae, or certain FHA insurance programs.

A sovereign rating action would directly impact some **US financial institution issuers**. The creditworthiness of US **central counterparty clearing houses** are highly dependent on the US sovereign rating, especially through their extensive use of US Treasury and government agency securities as collateral resources and because a significant amount of clearing funds are deposited at the Federal Reserve Bank. Therefore, a downgrade of the Aaa US sovereign rating would likely result in the Aaa clearing counterparty

ratings (CCRs) of The Depository Trust & Clearing Corporation's (DTCC Aa3 stable) clearing and depository agencies being downgraded by the same magnitude. **Bond fund** ratings reflect the creditworthiness of the portfolio of assets held by the funds. In the event of a rating action on the US sovereign, our Aaa-bf rated bond funds that invest primarily or exclusively in US Treasury or agency securities would be most affected. Their ratings would reflect any changes in the US government rating. Similarly, **money market funds** are also exposed to the US sovereign through their holdings of US Treasury or agency securities. A debt-limit impasse is generally accompanied by elevated redemption activity across the sector, pressuring liquidity. Such trends would likely be exacerbated by a missed interest payment by the US government. However, given the ability of fund advisors to actively manage their portfolios, we expect money market funds rated Aaa-mf to be largely resilient to a rating action on the US sovereign, as well as any short-term increase in market volatility.

In the **US infrastructure** sphere, greater sovereign linkage exists with certain issuers such as Bonneville Power Administration (BPA, Aa2 positive), National Railroad Passenger Corp.(Amtrak), DC (A1 stable) and Tennessee Valley Authority (TVA, Aaa stable). Given BPA and Amtrak's direct reliance on the US government for funds either through a borrowing line or federal appropriations, a US sovereign rating downgrade could lead to a negative rating action on these issuers. Also, issuers that contractually rely on BPA for cash flow such as Energy Northwest Columbia Generating Station (Aa2 positive) would be correspondingly affected. TVA is less directly reliant on the US federal government than BPA or Amtrak as shown by TVA's standalone aa1 baseline credit assessment (BCA, a measure of the company's standalone credit risk) and its access to internal liquidity sources. However, TVA's rating benefits from one notch of uplift to reflect the high probability of extraordinary support from the US government, and a downgrade of the government would eliminate this uplift.

Outside of the US, a US sovereign downgrade would negatively affect certain project finance issuers, such as Central Storage Safety Project Trust (Aa2 stable), whose rating is based on a guarantee or political risk insurance from the US International Development Finance Corporation, an agency of the US government.

Changes in the creditworthiness of sovereign or sovereign-related entities can affect **structured finance** transactions, especially to the extent that those entities provide credit support to the transactions via insurance or guarantees, or if the transactions are otherwise reliant on payments from the entities or securities issued by them.

There is one **US nonfinancial corporate issuer**, Army and Air Force Exchange Service (AAFES, Aa3 stable), that is a government-related issuer (GRI) and may be subject to a downgrade were the US sovereign rating to be downgraded. AAFES' Aa3 rating is a function of both its standalone baa1 BCA and GRI-related rating lift, and were the US sovereign rating downgraded or US government support to become less likely, AAFES' rating could be downgraded.

Debt issuers with ratings indirectly linked to the sovereign rating

For other issuers that have indirect linkages to the sovereign rating, the effects on credit quality would vary by their degree of exposure to the US sovereign and offsetting credit strengths. Issuers whose ratings incorporate uplift based upon assumptions of government support and those who receive substantial federal transfers, or have outsized dependence on federal employment or federal procurement spending, are the most exposed.

Indirectly linked **US public finance** credits are exposed to the credit quality of the US government, but are rated on a standalone basis and are not explicitly tied to the sovereign rating. The nature, extent and impact of federal exposure varies by credit. These include issuers that: receive substantial federal transfers as a percent of operating revenue; may have outsized dependence on federal employment or federal procurement spending, particularly state and local governments; or are highly reliant on US Treasury and agency securities for liquidity. Those issuers that possess strengths that mitigate federal exposure would be more resilient and could be rated higher than the sovereign. Vulnerable credits could experience downward rating pressure. While most US public finance issuers would be resilient to a one notch change in the US rating, some that are rated the same as the sovereign could face rating pressure depending on the degree of their sovereign linkages.

- **US state and local governments**: The vast majority of state and local governments would be resilient to a change in the US rating. States themselves are sovereign and have broad fiscal autonomy and ability to increase tax revenue, decrease expenditures, and manage their debt obligations. Local governments also have very stable revenue bases. High available resources could also mitigate a government's exposure to the sovereign. We would assess characteristics such as wealth levels relative to US medians, reliance on federal funding such as Medicaid, and revenue volatility.
- **Housing finance agencies (HFA)**: The US government's rating is incorporated in the Financial Position and Loan Portfolio credit factors in our HFA methodologies. For these factors, we would input a "stressed" score to determine if an issuer is vulnerable to a change in the US sovereign rating. We would assess the HFA's dependence on federal mortgage credit enhancement and/or government insurance to cover any losses from loan defaults. In general, **State HFAs** are likely to be more resilient to any pressures arising from a potential downgrade of the US sovereign rating. Both single family and multifamily bond programs tend to be seasoned with built-up collateralization levels far exceeding rating requirements. The State HFA portfolio has exposure to the Federal Home Loan Bank as they serve as liquidity providers to many of the variable rate issuers. This exposure, however, would be on a series-by-series basis as most issuers have a diversified group of liquidity providers. They are likely to substitute in this circumstance.
- **Higher education and other not-for-profit institutions**: The creditworthiness of most US colleges and universities would likely be resilient to a change in that of the US sovereign because they generally have substantial fiscal autonomy and good liquidity, enabling them to withstand moderate cuts or interruptions in federal funding for some period of time. We would assess an institution's reliance on federal revenue for operations, including federal research funding, financial aid and Medicare and Medicaid revenues at the academic medical centers. A market downturn caused by a US downgrade would be broadly negative for the sector, impacting individual institutions differently depending on reliance on endowment income to support operations.
- **Healthcare and hospitals**: Some hospitals have outsized reliance on federal Medicare and Medicaid revenues, and as such, could be vulnerable to a prolonged disruption at the federal level, depending on their liquidity positions. Consequently, we would identify institutions with the highest exposure and review the credits on a case-by-case basis.

Credit implications for **banks** depend upon several factors. A downgrade of the US government could have implications for the ratings of those US banks which incorporate uplift due to the potential for government support. However, at present this would involve only a small number of US banks since we currently assume a low probability of government support for most US banks; for those US bank ratings where we do incorporate government support, none include more than one notch of ratings uplift. In addition, the bank rating methodology heavily relies on elements of the sovereign scorecard to assess how the operating and economic environment affect a bank's credit strength in a specific financial system.

In some cases, a downgrade of the US government could lead to a lowering of the macro profile for the US banking system. However, we have already recently lowered the macro profile of the US banking system to Strong+ from Very Strong-, making a further downgrade of the macro profile less likely. The lower macro profile reflects our view that banks' funding and asset-liability management (ALM) risks have been exacerbated by the significant increase in interest rates and the ongoing reduction in bank reserves and deposits caused by the unwinding of unconventional monetary policy through quantitative tightening.

The deteriorating operating environment could also potentially leave banks more vulnerable to any market disruptions caused by a US sovereign default, which could also have bank rating implications. That being said, while most US banks' hold significant amounts of US government and agency securities in their securities portfolio, we do not expect rating downgrades on those securities, due to a sovereign downgrade, in and of themselves to have rating implications for US banks.

Insurers tend to be indirectly linked to the US sovereign through their investment exposures. In the event of a downgrade of the US sovereign due to a missed debt payment, the ratings of US insurers with insurance financial strength or debt ratings above the new sovereign rating could be affected.

Most US **infrastructure** credits would be resilient to a modest weakening in the US government rating. For example, in the airports, ports and toll roads sectors, the highest-rated credits are at the Aa2 level based on standalone credit quality rather than US government linkages, and utilities are generally rated Aa2 or lower. To the extent any explicit or implicit federal government support

has been incorporated into these ratings, that expectation would be adjusted if the federal government proceeds down a path that indicates a lower willingness or ability to provide support.

Some **structured finance** transactions can also have indirect dependencies on the creditworthiness of the US government. While these transactions may have meaningful exposure to the sovereign's credit risk, their creditworthiness is additionally based on a number of other factors. Examples include transactions backed by: 1) equipment contracts in which US government agencies make up a portion of the obligor; 2) underlying collateral pools that are partially defeased by US Treasury securities or by government agency obligations; or credit tenant lease deals secured by loans on buildings fully leased to US government entities that rely on other credit factors; and 3) underlying collateral pools that are backed by a mix of private and FFELP student loans.

Lastly, in the event of a downgrade of the US sovereign rating, we would expect little or no rating impact for the highest-rated US **nonfinancial companies**. The strongest companies have ratings that are not only independent from their associated sovereign entities, but that can even be higher in certain cases. Highly rated companies have at least three characteristics that provide partial insulation from conditions that usually accompany a sovereign rating downgrade: diverse sources of revenue, robust internal cash flow and diverse options for external funding.

In addition, a default on a perceived risk-free asset would negatively affect the fragile US economy even if resolved quickly. Since we expect any potential default on debt payments by the US government to be quickly cured, we do not anticipate significant financial market disruption. If such disruption were to occur, issuers and transactions with weak financial profiles and high liquidity risk would be most vulnerable to a downgrade or default.

For more detail on how we assess the impact of sovereign credit quality on other issuers, see: Assessing the Impact of Sovereign Credit Quality on Other Ratings, June 2019.

© 2023 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

CREDIT RATINGS ISSUED BY MOODY'S CREDIT RATINGS AFFILIATES ARE THEIR CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED BY MOODY'S (COLLECTIVELY, "PUBLICATIONS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE APPLICABLE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER OPINIONS INCLUDED IN MOODY'S PUBLICATIONS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S PUBLICATIONS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES ITS PUBLICATIONS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS, AND PUBLICATIONS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS OR PUBLICATIONS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the credit rating process or in preparing its Publications.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING, ASSESSMENT, OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any credit rating, agreed to pay to Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it fees ranging from $1,000 to approximately $5,000,000. MCO and Moody's Investors Service also maintain policies and procedures to address the independence of Moody's Investors Service credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service, Inc. and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at www.moodys.com under the heading "Investor Relations — Corporate Governance — Charter Documents - Director and Shareholder Affiliation Policy."

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for Japan only: Moody's Japan K.K. ("MJKK") is a wholly-owned credit rating agency subsidiary of Moody's Group Japan G.K., which is wholly-owned by Moody's Overseas Holdings Inc., a wholly-owned subsidiary of MCO. Moody's SF Japan K.K. ("MSFJ") is a wholly-owned credit rating agency subsidiary of MJKK. MSFJ is not a Nationally Recognized Statistical Rating Organization ("NRSRO"). Therefore, credit ratings assigned by MSFJ are Non-NRSRO Credit Ratings. Non-NRSRO Credit Ratings are assigned by an entity that is not a NRSRO and, consequently, the rated obligation will not qualify for certain types of treatment under U.S. laws. MJKK and MSFJ are credit rating agencies registered with the Japan Financial Services Agency and their registration numbers are FSA Commissioner (Ratings) No. 2 and 3 respectively.

MJKK or MSFJ (as applicable) hereby disclose that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MJKK or MSFJ (as applicable) have, prior to assignment of any credit rating, agreed to pay to MJKK or MSFJ (as applicable) for credit ratings opinions and services rendered by it fees ranging from JPY100,000 to approximately JPY550,000,000.

MJKK and MSFJ also maintain policies and procedures to address Japanese regulatory requirements.

REPORT NUMBER 1358892

Contacts

Jeffrey S. Berg +1.212.553.3611
Assoc Managing Director/ RPO
jeffrey.berg@moodys.com

Mauro Leos +1.212.553.1947
Associate Managing Director
mauro.leos@moodys.com

Susan Fitzgerald +1.212.553.6832
Managing Director
susan.fitzgerald@moodys.com

Daniel Steingart, CFA +1.949.429.5355
VP-Sr Credit Officer
daniel.steingart@moodys.com

Paloma San Valentin +1.212.553.4111
MD-North America Corporate Finance
paloma.sanvalentin@moodys.com

Clifford J Kim +1.212.553.7880
VP-Sr Credit Officer
clifford.kim@moodys.com

David Fanger +1.212.553.4342
Senior Vice President
david.fanger@moodys.com

Marc R. Pinto, CFA +1.212.553.4352
MD-Financial Institutions
marc.pinto@moodys.com

Ana Arsov +1.212.553.3763
MD-Financial Institutions
ana.arsov@moodys.com

Marie Diron +44.20.7772.1968
MD-Global Sovereign Risk
marie.diron@moodys.com

Rachael Royal McDonald +1.212.553.4456
Associate Managing Director
rachael.mcdonald@moodys.com

Eva Bogaty +1.415.274.1765
Associate Managing Director
eva.bogaty@moodys.com

Navneet Agarwal, CFA +1.212.553.3674
MD-Americas Structured Fin
navneet.agarwal@moodys.com

Jessica Gladstone, CFA +1.212.553.2988
Associate Managing Director
jessica.gladstone@moodys.com

Jim Hempstead +1.212.553.4318
MD - Global Infrastructure & Cyber Risk
james.hempstead@moodys.com

Donald Robertson +1.212.553.4762
Associate Managing Director
donald.robertson@moodys.com

Scott Robinson, CFA +1.212.553.3746
Associate Managing Director
scott.robinson@moodys.com

CLIENT SERVICES

Americas	1-212-553-1653
Asia Pacific	852-3551-3077
Japan	81-3-5408-4100
EMEA	44-20-7772-5454

MOODY'S INVESTORS SERVICE