

ISSUER IN-DEPTH

10 May 2018

[Rate this Research](#) >>

Contacts

Genevieve Nolan +1.212.553.3912
 VP-Senior Analyst
 genevieve.nolan@moodys.com

Timothy Blake +1.212.553.4524
 MD-Public Finance
 timothy.blake@moodys.com

Nicholas Samuels +1.212.553.7121
 VP-Sr Credit Officer
 nicholas.samuels@moodys.com

Emily Raimes +1.212.553.7203
 VP-Sr Credit Officer/
 Manager
 emily.raimes@moodys.com

Katie Townsend +1.312.706.9957
 Associate Analyst
 katie.townsend@moodys.com

CLIENT SERVICES

Americas 1-212-553-1653

Asia Pacific 852-3551-3077

Japan 81-3-5408-4100

EMEA 44-20-7772-5454

Commonwealth of Massachusetts

Strong economy makes outsized liabilities affordable

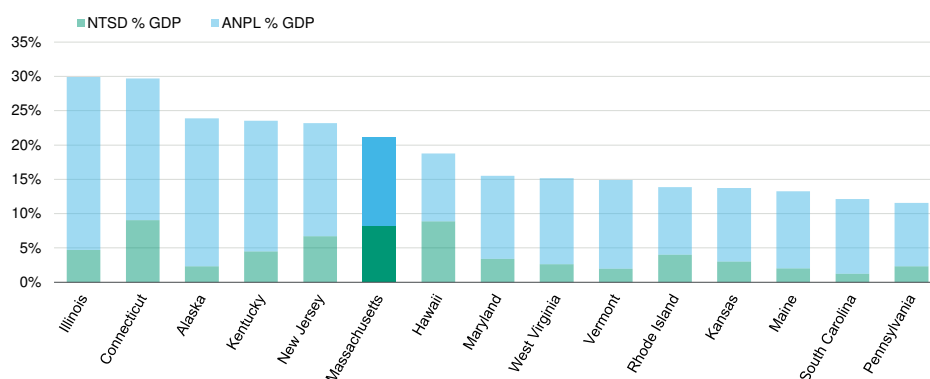
[Massachusetts'](#) (Aa1 stable) debt and pension liabilities are among the highest in the nation and will remain elevated given its borrowing practices, which include issuing debt on behalf of other municipal governments. Massachusetts' strong economy has kept pace with growing liabilities, but difficult decisions may be ahead in the event the state's trend of above-average economic growth is reversed due to its aging population.

- » **Massachusetts' debt and pension liabilities are sixth highest among the 50 states, as a percentage of GDP.** The combined state and local government debt burden is more moderate.
- » **Borrowing on behalf of other governments has helped to drive up Massachusetts' liabilities.** The commonwealth has amassed large liabilities, in part, by borrowing for schools and mass transit; many other states handle this borrowing at the local level. State pension funding has been lower than levels needed to keep liabilities from growing.
- » **Massachusetts' growing economy is providing a solid base to keep pace with its high liabilities.** The state's higher education, technology and healthcare sectors are among the strongest in the nation. But future economic slowing, potentially driven by the commonwealth's aging population, could result in challenging budget decisions ahead.

Exhibit 1

Massachusetts debt and pension liabilities are sixth highest in the nation

State net tax supported debt (NTSD) and state adjusted net pension liability (ANPL) as a % of gross domestic product 2016



*State NTSD debt data as of fiscal 2017 as reported by Moody's; State ANPL data as of fiscal 2016 as reported by Moody's; GDP data as of 2016

Source: Moody's Investors Service; US Bureau of Economic Analysis

Massachusetts' long-term liabilities are among the highest in the nation

Massachusetts high debt and pension liabilities weigh on the commonwealth's overall credit quality, with its significant leverage distinguishing it from most of its state peers. Liabilities have been manageable, though, because of a more moderate burden across the whole tax base.

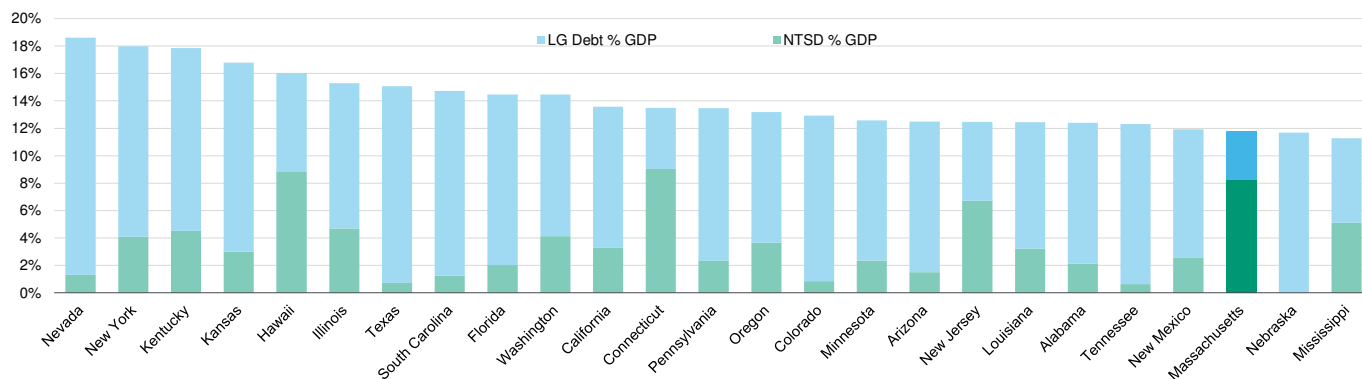
Massachusetts has one of the highest debt burdens in the nation, with the [third highest net tax supported debt \(NTSD\) burden](#) and sixth highest [combined debt and adjusted net pension liability \(ANPL\)](#) burden. The commonwealth's 2017 tax supported debt equaled 8.3% of its GDP, significantly higher than the sector median of 2.1%. Adding in pension liabilities, the percentage increases to nearly 21%, three times' the sector median of 7.0%.

These figures, however, reflect borrowing for school construction and mass transit that other states account for at the local level. When factoring in debt issued by local governments, as reported by the US census, Massachusetts' leverage is more moderate. State and local debt represents 11.8% of Massachusetts' GDP, ranking the state 23rd and approximating the sector median of 11.2% (see exhibit 2). Including adjusted net pension liabilities for both the state and local governments, Massachusetts' leverage is likely to increase in comparison to its peers.

Exhibit 2

Massachusetts' total state and local government debt burden more in line with peers

State NTSD + local government debt as a % of GDP



*State NTSD debt data as of fiscal 2017 as reported by Moody's; Local Government debt data as of fiscal 2016 as reported by US Census; GDP data as of 2016
Source: State NTSD data from Moody's Investors Service; Local Government debt data from US Census; GDP from US Bureau of Economic Analysis

Leverage reflects sizable borrowing for downstream entities

Two major components of the state's borrowing are done for schools and transit authorities, which together are a quarter of Massachusetts' outstanding debt. This practice distinguishes it from some of its peers and reflects the state's active involvement in ensuring effective service delivery at the local level.

The commonwealth borrows for school district capital improvements across the state through the [Massachusetts School Building Authority](#) (MSBA, Aa2 stable senior, Aa3 stable subordinate). The program's outstanding debt, which is paid with dedicated statewide sales taxes, was a significant 14.4% of NTSD in 2017. Other states largely leave school construction costs to be born by local entities, but Massachusetts is not the only one to borrow for school capital projects. [Florida](#) (Aa1 stable) borrows heavily for school construction via its [Public Education Capital Outlay](#) program (Aa1 stable), in addition to at least five other states.

Massachusetts also takes an active role in funding capital costs for transit operations. Statewide sales tax revenues are committed to pay debt issued by the [Massachusetts Bay Transportation Authority](#) (MBTA, Aa2 stable), which was 9.7% of NTSD in 2017. The state also provides a general obligation backstop pledge on [ferry system debt](#).

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

Commonwealth debt leverage also reflects prudent funding of capital maintenance costs

In recent years the administration has focused its capital improvement plans on addressing maintenance needs of existing assets. As a result of these road and bridge infrastructure investments, Massachusetts has a lower infrastructure maintenance backlog.

The commonwealth enacted two programs in 2010 and 2014, the Accelerated Bridge and Rail Enhancement programs, to address its backlog of infrastructure needs. As of 2017, approximately 8.2% of the commonwealth's debt outstanding was issued to address these critical infrastructure needs and its investment paid off. Based on Federal Highway Administration data, in 2007 11.8% of the state's bridges were deemed deficient. That has fallen to 9.3%, the most recent data show, just slightly greater than the 9% state median, and the state's high wealth means it can afford further improvements (see Exhibit 3).

Even with existing borrowing practices, the commonwealth's related authorities still face mounting capital maintenance costs. For example, MBTA's capital backlog is \$7.3 billion, reflecting its status as the nation's oldest transit system, in addition to being located in the growing [Boston](#) (Aaa stable) metropolitan area with difficult weather conditions. Massachusetts schools are in overall good condition but 19% of buildings require moderate or extensive renovation in the near future, according to the MSBA's 2016 school survey. Leverage is likely to increase toward MSBA's statutory limit of \$10 billion as the state focuses on addressing these needs.

Exhibit 3

Massachusetts has invested heavily to improve its bridges Percent of deficient bridges compared to per capita personal income



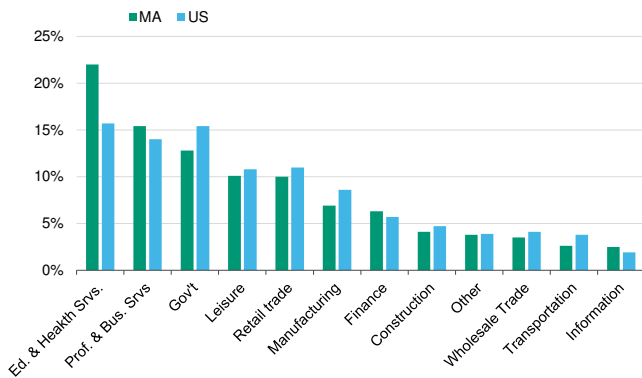
Source: US Federal Highway Administration and Moody's Investors Service

Strong economy positions state to keep pace with long-term liabilities

Massachusetts' economy is well positioned to keep pace with its long-term liabilities. Economic growth has been stronger than the national average, with employment increasing at an average annual rate of 0.6% since 2000, including the two periods of economic declines. During this period the state experienced a shift away from manufacturing jobs dominating employment, to jobs in education, healthcare and professional services. These three sectors now make up almost 40% of total state nonfarm employment, up from 31% in 2000, according to the Bureau of Labor Statistics (BLS). Conversely, manufacturing fell to 6.9% from 12.1% over the same period. High-tech jobs are 8.3% of the state's employment, well above the national rate of 4.8% (See Exhibit 4).

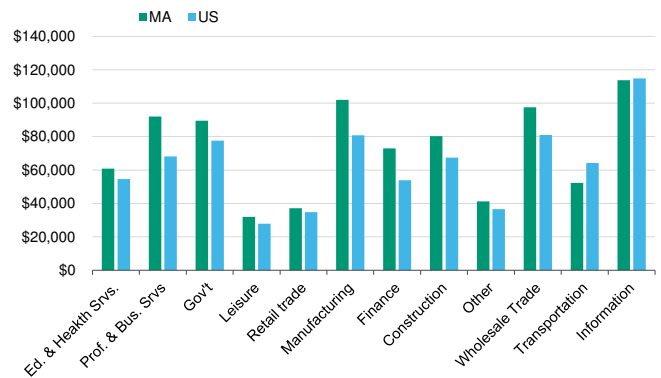
Average wages in every industry in Massachusetts except transportation/utilities and information outpace the nation, according to BLS (see Exhibit 5). Except for the two-year decline during the most recent recession, wages have steadily grown across the commonwealth, outpacing the nation as a whole. Between 2007 and 2016, average annual wage and salary growth in the commonwealth was 1.7%, exceeding the national average annual rate of 1.2%. Reflecting wage gains, per capita income reached 131% of the US average in 2017. At \$505.8 billion, the commonwealth's gross domestic product, or measurement of its total economic output, placed it 11th among states in 2016. Its GDP per capita now is the highest of any state.

Exhibit 4
Eds, meds and white collar jobs dominate Massachusetts employment
 Percentage of total employment



Source: Bureau of Labor Statistics

Exhibit 5
Wages in almost every Massachusetts industry outpace the US
 Average industry wages

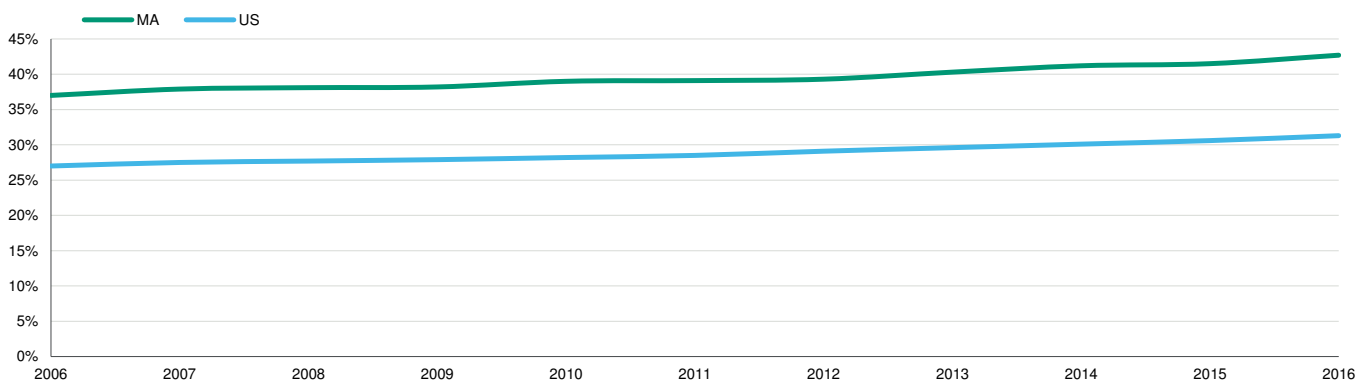


Industries are ordered based on percentage of Massachusetts total employment.
 Source: Bureau of Labor Statistics

Population growth, however, has been less robust (see Exhibit 5). Currently the 15th largest state by population, the number of commonwealth residents grew to 6.8 million from 6.3 million between 2000 and 2016, a nearly 8.0% growth rate, but almost half the US rate of 15.0%.

The state population grayed over this period, too. While the state's percentage of working age residents is 40%, approximating the rate of the US, this portion of the population has been shrinking. The number of prime working age residents, or people 25 to 54 years old, declined by 4.5% since 2000. This is a striking contrast to the US 4.0% growth rate of working age residents over the same period. The median age in the commonwealth is now 39.4 years or 13th highest in the nation, exceeding the national median age of 37.9 years. Favorably, the commonwealth supplies employers with a well-trained labor pool. By 2016 nearly half the commonwealth's people of working age, 25 years and older, had a bachelor's degree, significantly exceeding the national rate of 31.3% (see Exhibit 6).

Exhibit 6
Massachusetts' labor pool consistently exceeds national levels of educational attainment
 Percent of population 25 and older with bachelor's degree or higher



Sources: US Census Bureau; University of Massachusetts Donahue Institute Massachusetts Economic Due Diligence Report Q2 2018

The state has become an attractive place to live and work. The Tax Foundation ranks Massachusetts' business tax climate 22nd in the nation, with a low sales and individual income tax ranking, balanced out by a burdensome property tax levy.

Massachusetts' economy is strong, but a slowdown may be on the horizon (see Exhibit 7). Some declines are already starting to show, with GDP growth slowing to 1.6% in the first quarter of 2018, below the national growth rate of 2.3%. Moody's Analytics predicts this trend of lower GDP growth to continue through 2020, when the state's economy is only expected to grow by 0.9%. The slowing

economy is in part because of the aging work force, according to University of Massachusetts Donahue Institute.¹ Aging is likely to continue over the near term, as Moody's Analytics predicts working age populations will decline slightly to below 40% of total state residents by 2020, with a slow decline continuing to 37% by 2040.

Exhibit 7

Massachusetts' growth may taper off in the coming two years

Massachusetts' wealth and growth have outpaced the US...

	MA	US
GDP Average Annual Growth (2013-2017)	4.5%	3.0%
Employment Average Annual Growth (2013-2017)	1.6%	1.5%
Avg Annual Salary and Wage Growth (2007-2016)	1.7%	1.2%
Population change 2000-2016	8.0%	15.0%
GDP Per Capita (2016)	\$ 65,281	\$ 57,542
Per Capita Income (2017)	\$ 65,890	\$ 50,392

... but a slight slow down may be on the horizon

	MA	US
GDP Annual Growth (Moody's Analytics Forecast)		
	2019	1.7%
	2020	0.9%
Employment Annual Growth (Moody's Analytics Forecast)		
	2019	1.7%
	2020	-0.1%

Source: Moody's Analytics; US Census Bureau; US Bureau of Labor Statistics; US Bureau of Economic Analysis

Should the projected economic slow down come to fruition, it may put the state in a position of having to make difficult budgetary decisions to accommodate its elevated fixed costs while maintaining adequate service delivery and balancing annual budgets. Regardless of the use of funds borrowed, the commonwealth has committed itself to repaying significant liabilities. Fixed costs have been an elevated 20% of revenue since fiscal 2014, significantly exceeding the 50 state median of 9-10% during this period. High fixed costs reduce the commonwealth's budgetary flexibility, exposing the state to more difficult budgetary decisions when revenues decline. Favorably, the commonwealth is [moderately prepared to handle a recession](#), with its diversified revenue structure, as well as moderate expenditure flexibility and reserves, balancing out the aforementioned high costs.

Moody's related publications

[States - US: Medians - State debt continues slow growth trend](#), April 2018

[Medians - Moderate Adjusted Net Pension Liability Growth in 2016 Precedes Spike in 2017](#), September 2017

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

Endnotes

- 1 [MassBenchmarks Bulletin April 27, 2018](#)

© 2018 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 INVESTORS SERVICE, INC. AND ITS RATINGS AFFILIATES ("MIS") ARE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MOODY'S PUBLICATIONS MAY INCLUDE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES. 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. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS AND MOODY'S 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. CREDIT RATINGS AND MOODY'S PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. NEITHER CREDIT RATINGS NOR MOODY'S PUBLICATIONS COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS AND PUBLISHES MOODY'S 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 AND MOODY'S 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 OR MOODY'S 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.

CREDIT RATINGS AND MOODY'S 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 rating process or in preparing the Moody's 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 SUCH RATING OR 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 rating, agreed to pay to Moody's Investors Service, Inc. for appraisal and rating services rendered by it fees ranging from \$1,500 to approximately \$2,500,000. MCO and MIS also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at www.moody's.com under the heading "Investor Relations — Corporate Governance — 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 61 003 399 657 AFSL 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. It would be reckless and inappropriate for retail investors to use MOODY'S credit ratings or publications when making an investment decision. If in doubt you should contact your financial or other professional adviser.

Additional terms for Japan only: Moody's Japan K.K. ("MJJK") 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 MJJK. 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. MJJK 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.

MJJK 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 MJJK or MSFJ (as applicable) have, prior to assignment of any rating, agreed to pay to MJJK or MSFJ (as applicable) for appraisal and rating services rendered by it fees ranging from JPY200,000 to approximately JPY350,000,000.

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

Contacts

Genevieve Nolan
VP-Senior Analyst
genevieve.nolan@moody's.com

+1.212.553.3912

Katie Townsend
Associate Analyst
katie.townsend@moody's.com

+1.312.706.9957

CLIENT SERVICES

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