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CREDIT OPINION
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Massachusetts (Commonwealth of)

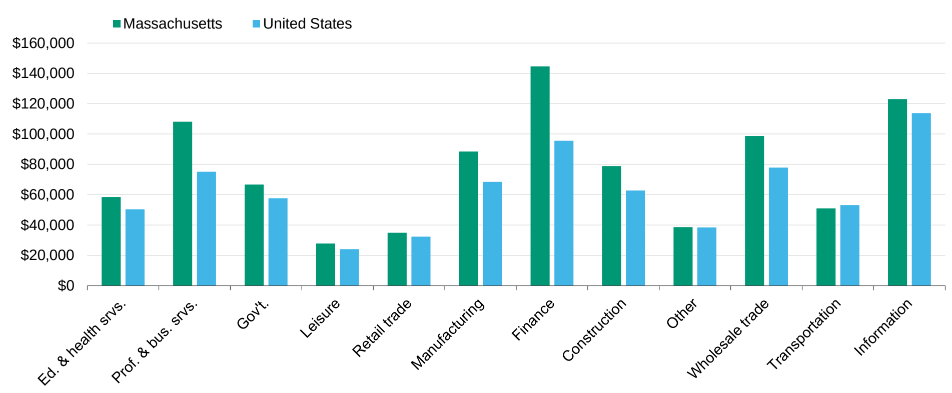
Update to credit analysis

Summary

Massachusetts' (Aa1 stable) strong credit position relies heavily on its strong economic profile, driven by a diversified and highly educated employment base centered on jobs in growth knowledge industries that pay above-average wages: healthcare, education and technology (see Exhibit 1). The commonwealth has taken advantage of the ongoing economic expansion, using increasing tax revenue to rebuild reserves, including a sizable deposit in the most recent fiscal year that will help buffer the credit in the event of a potential economic slowdown.

Debt and pension liabilities remain among the highest in the nation, driven upward by borrowing paid for with statewide taxes that in most other states would be done by local governments, in particular for school construction (Massachusetts School Building Authority; senior lien Aa2 stable) and for mass transit (Massachusetts Bay Transportation Authority, senior lien Aa2 stable). As a result, fixed costs also are relatively high and somewhat limit budget flexibility. Population growth is slowing and Massachusetts' residents are aging, which will dampen future economic expansion somewhat. Job growth is below the national average and this trend is likely to continue amid tight labor markets.

Exhibit 1
Massachusetts' industry wages outpace the US in nearly every category



Data reflects 2018 figures
Source: US Bureau of Labor Statistics

Credit strengths

» Growing economy focused on important knowledge sectors that pay above average wages such as healthcare, education and technology

» Strong financial management practices, particularly willingness to close budget gaps quickly through spending cuts, revenue increases and use of reserves

» Adequate reserves and commitment to maintain them at levels that provide a healthy buffer against potential economic downturns

Credit challenges

» Combined debt and pension liabilities that are sixth highest in the nation relative to GDP

» Elevated fixed costs that limit budget flexibility

» Aging demographic profile with overall population growth that lags the nation

» Above average exposure to climate risks with most of its gross domestic product generated in coastal counties

Rating outlook

Massachusetts' stable outlook reflects our expectation that the commonwealth will continue its trend of strong financial management, taking proactive measures to navigate credit challenges that could emerge if the economy falters during the next few years.

Factors that could lead to an upgrade

» Moderated debt and pension burdens, especially relative to peers

» Continued growth of reserves and establishment of stronger constraints on their use

» Established trend of structural budget balance

Factors that could lead to a downgrade

» Protracted structural budget imbalance

» Reserves or liquidity that falls below adequate levels

» Growth in leverage relative to state GDP or rising fixed costs relative to state revenue

Key indicators

Exhibit 2

Massachusetts (Commonwealth of)	2014	2015	2016	2017	2018	50-State Median (2018)
Operating Fund Revenues (000s)	$30,863,081	$32,946,934	$33,414,744	$33,910,836	$36,483,673	$11,520,082
Available Balances as % of Operating Fund Revenues	8.7%	7.7%	7.4%	6.6%	8.7%	7.8%
Nominal GDP (billions)	$473.5	$502.7	$519.7	$540.9	$567.3	$234.5
Nominal GDP Growth	4.2%	6.2%	3.4%	4.1%	4.9%	4.6%
Total Non-Farm Employment Growth	2.0%	1.9%	1.9%	1.3%	0.9%	1.1%
Fixed Costs as % of Own-Source Revenue	21.9%	20.3%	23.1%	22.8%	20.7%	NA
Adjusted Net Pension Liabilities (000s)	$61,059,039	$53,989,121	$65,193,204	$80,449,143	$81,227,853	$12,209,760
Net Tax-Supported Debt (000s)	$37,439,708	$39,008,274	$40,753,424	$41,744,847	$42,193,311	$4,146,966
(Adjusted Net Pension Liability + Net Tax-Supported Debt) / GDP	20.8%	18.5%	20.4%	22.6%	21.8%	7.8%

Source: US Bureau of Economic Analysis; US Bureau of Labor Statistics; Massachusetts FY14-FY18 CAFRs; Moody's Investors Service

Profile

The Commonwealth of Massachusetts is the 15th largest state by population, boasting nearly 6.9 million residents in 2018. Its gross domestic product, reaching $569.5 billion, ranks 10th among the states. Per capita income was 131.7% of the national average in 2018, the 2nd highest.

Detailed credit considerations

Economy: highly educated and well paid workforce drives state revenue

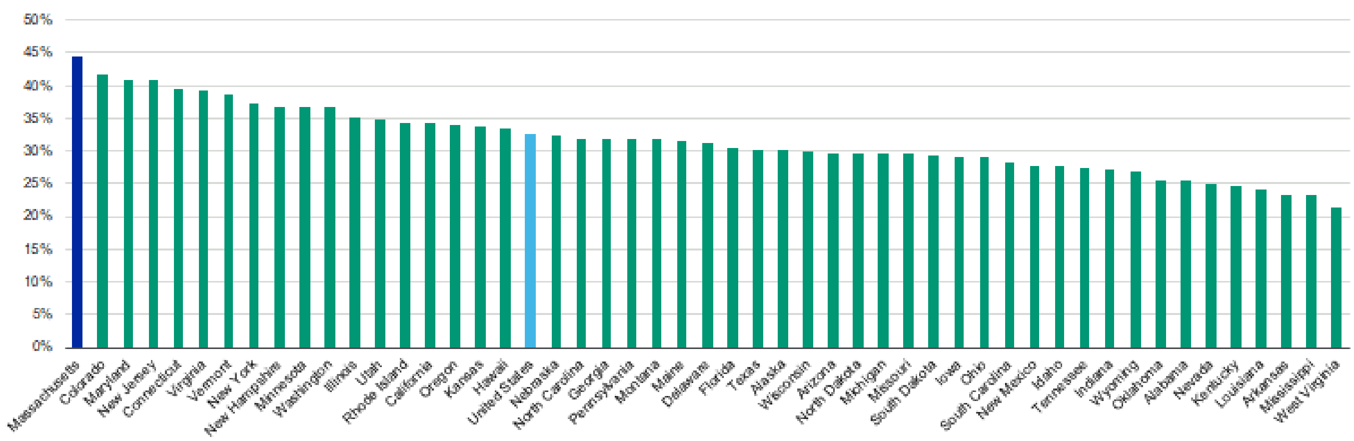
Massachusetts benefits from strong healthcare, education and technology sectors, with average annual earnings in the commonwealth grew, on average, 1.7% annually over the last 10 years, outpacing the US rate of 1.2%. Reflecting these gains, per capita income is 131.7% of the US average. Overall economic growth is slowing but still keeping pace with the US. Gross domestic product (GDP) grew 2.2% in the third quarter of 2019, slightly outpacing the US growth rate of 2.1%.

Massachusetts' labor pool is well-trained. By 2018 nearly half of working age residents, 25 years and older, had at least a bachelor's degree, significantly exceeding the national rate of 33% (see Exhibit 3). This well trained workforce has been one reason for the commonwealth's employment gains in education and healthcare sectors.

Exhibit 3

Massachusetts has highest percentage of residents with a college degree

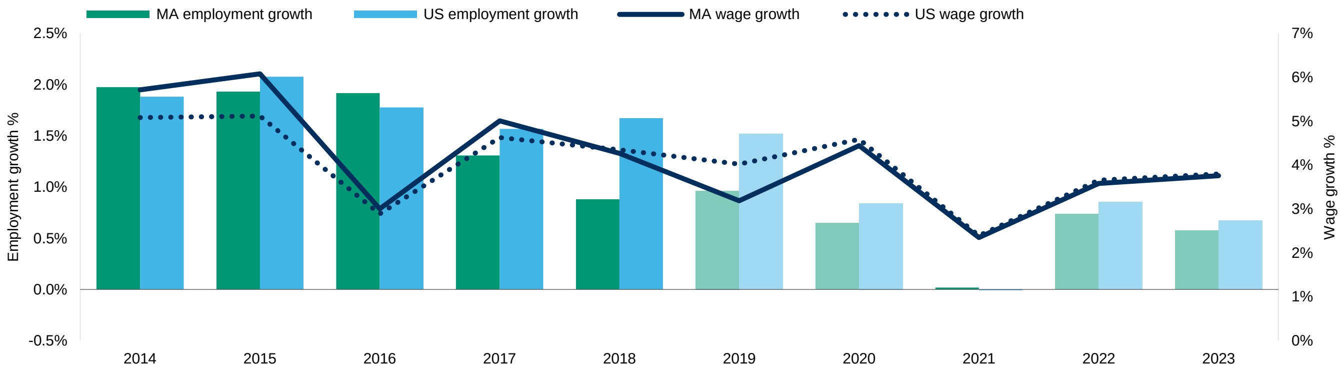
% of residents 25 and older with a bachelor's degree or higher (2018)



Source: US Census

Massachusetts' recent employment growth has tapered off, projecting to have increased only 0.9% year-over-year, compared to 1.7% for the US, which has also seen jobs growth slow. Because of a nearly fully tapped workforce we expect this trend to continue over the next two years (see Exhibit 4). In December 2019 the Massachusetts unemployment rate fell to 2.8% compared to 3.5% nationally.

Exhibit 4
Massachusetts' employment growth will continue to lag the US, but wages will keep pace



2014-2018 data reflect actual results; 2019-2023 data are projections
Source: US Bureau of Labor Statistics; US Bureau of Economic Analysis; Moody's Analytics

Population growth is likely to continue its trend of lagging the US, with 0.5% total growth projected in 2019, compared to 0.6% for the US. Massachusetts' population increased by nearly 8% between 2000 and 2016 but that was almost half the US rate of 15%. The state population grayed over this period, too. The median age in the commonwealth is now 39.4 years or 16th highest in the nation, exceeding the national median age of 38.2 years. The state's percentage of working age residents is 40%, approximating the rate of the US, but this portion of the population has been shrinking. The number of prime working age residents, or people 25 to 54 years old, declined by 3.9% between 2000 and 2018. This is a striking contrast to the US 4.6% growth rate of working age residents over the same period.

Finances and liquidity: growing reserves will help state better manage the next downturn

Continued revenue growth and prudent planning resulted in a record-setting contribution to reserves in fiscal 2019, further buffering the commonwealth's budget should economic growth wane in the coming years.

A perennial late budget adopter, the commonwealth enacted the fiscal 2020 budget plan a month after the fiscal year started. Taking advantage of revenue growth, K-12 public education funding is at an all-time high and the governor has proposed a significant new five-year capital spending plan. Year-to-date tax revenue collections support these plans, with taxes slightly above budgeted expectations and 4.9% above fiscal 2019 collections through January. The increase reflects large gains in both sales (23% of total tax revenue) and income (58% of total tax revenue) tax receipts.

As of January 1 the state's income tax rate fell to 5.0% from 5.05%, following a statutory framework passed in 2002 that lowered the income tax rate to the current floor if certain revenue benchmarks were met. The fiscal 2020 budget accounted for this expected change, with a $88 million reduction in income tax revenue expected. The governor proposed his fiscal 2021 budget last month, with a proposed spending increase of 2.3% over projected fiscal 2020 totals, excluding transfers to the Medical Assistance Trust Fund. The legislature is likely to introduce its own budget bills beginning in April. Last year the governor introduced a new $18 billion capital funding bill, aimed at modernizing the Massachusetts Bay Transportation Authority and bridge and highway construction. This month an emergency preamble was filed as a means to expedite the release of funds detailed in the bill, highlighting the need for fixes to the commonwealth's growing transportation problems.

Fixed costs continue to be a significant budget driver for the commonwealth. In 2018 combined debt service, pension and other post employment benefits (OPEB) employer contribution costs were 18.9% of revenue, well above the 7.5% sector median. Compounding the situation, the commonwealth under contributes to its pension plans. Those contributions are not enough to “tread water” or prevent its net pension liability (NPL) from growing even if investment returns meet all the actuarial assumptions associated with the plan. The contributions were about 78% of our tread water benchmark, which is the payment covering the year's newly accrued service costs and interest on the NPL. Fixed costs as a percent of revenue would have been 20.7% in 2018 had the mark been met (see Exhibit 5).

Exhibit 5

Massachusetts consistently contributes below the tread water amount

Massachusetts fixed costs (in $ 000)	2014	2015	2016	2017	2018
Debt service	$ 3,748,306	$ 3,667,371	$ 3,929,867	$ 3,831,754	$ 3,870,461
OPEB contribution	$ 608,000	$ 637,000	$ 614,000	$ 546,000	$ 520,703
Pension contribution	$ 1,608,896	$ 1,751,386	$ 1,927,665	$ 2,101,362	$ 2,360,543
Pension treadwater	$ 2,314,085	$ 2,223,624	$ 2,768,061	$ 3,049,989	$ 3,012,349
Fixed costs - contribution	$ 5,965,202	$ 6,055,757	$ 6,471,532	$ 6,479,116	$ 6,751,707
Fixed costs - treadwater	$ 6,670,391	$ 6,527,995	$ 7,311,928	$ 7,427,743	$ 7,403,513
Total own source revenue	$ 29,603,839	$ 31,369,495	$ 37,759,602	$ 32,612,846	$ 35,708,828
Fixed costs - contribution	20.2%	19.3%	17.1%	19.9%	18.9%
Fixed costs - treadwater	22.5%	20.8%	19.4%	22.8%	20.7%

*Fiscal 2019 audited results not yet available

Source: Massachusetts CAFRs FY14-FY18; Moody's Investors Service

High fixed costs are partly attributable to the Commonwealth's absorption of certain costs covered by local governments in most other states. Regardless of the reason for the elevated cost, steep fixed costs reduce the commonwealth's budgetary flexibility, exposing the state to more difficult budgetary decisions when revenue 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.

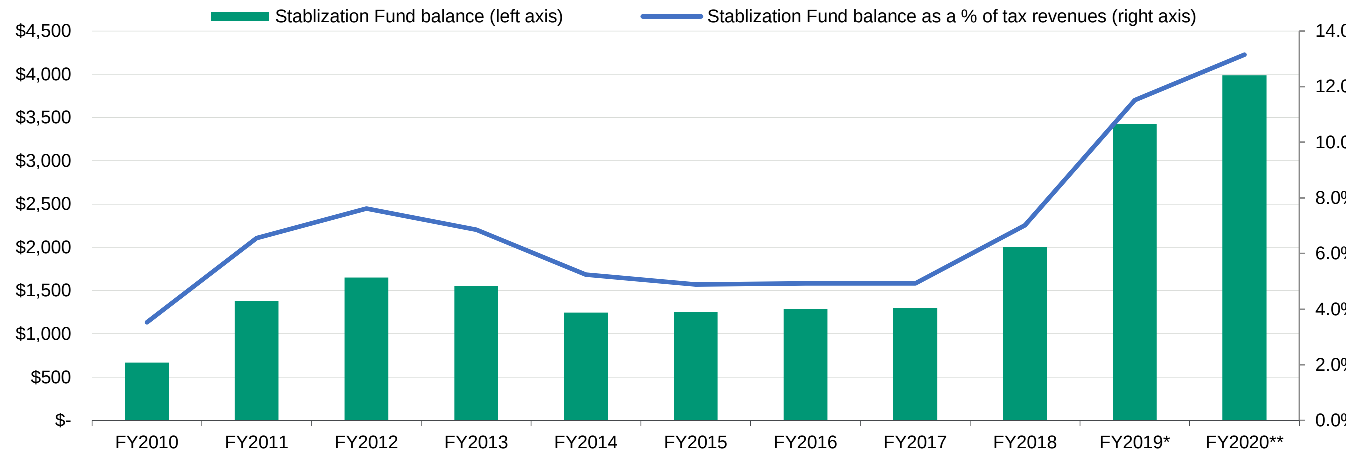
LIQUIDITY

After suspending certain deposits into reserves in fiscal 2015 and 2016 to close operating deficits, the commonwealth embarked on a commitment to rebuild its rainy day balance. The result has been to nearly double the amount of funds set aside, largely because of strong capital gains revenue since fiscal 2018.

The commonwealth ended fiscal 2019 with a stabilization fund balance of $3.4 billion, with net inflows of $1.4 billion representing a 71% gain over fiscal 2018 year-end balance. The increase was primarily driven by deposits of surplus capital gains tax revenue and end of year operating surplus. The current year budget projects the balance to grow to nearly $4.0 billion or 13% of projected tax revenue (see Exhibit 6).

Exhibit 6

Reserves rebound on the back of strong capital gains tax receipts



*Year-end unaudited estimate **Budgeted

Source: Massachusetts Information Statement February 2020; Massachusetts FY2020 Enacted Budget

Debt and pensions: elevated long-term liabilities remain a drag on overall credit quality

The commonwealth's high debt burden reflects its focus on funding necessary maintenance, modernization and growth capital plans at both the state and local level. Given recent capital plans, we expect the commonwealth to continue issuing debt for key priorities, but the overall economy will continue to provide a solid foundation for paying the long-term costs.

Net tax-supported debt reached $41.3 billion as of Moody's 2019 state debt medians report (see Exhibit 5), comprised primarily of general obligation bonds (55%) but also includes sales tax backed debt for other underlying entities (25%). The state's debt levels ranked second-highest among the 50 states on a per capita basis. Debt is elevated in part because of the commonwealth's practice of financing projects for local governments, including a robust school district capital bonding program and debt for the Massachusetts Bay Transportation Authority (see Exhibit 7). Per the governor's fiscal 2020 five-year capital investment plan, the state expects to issue up to $2.43 billion of general obligation bonds.

Exhibit 7

Nearly 25% of Massachusetts' debt reflects borrowing for local governments

Security		Fiscal 2018 debt (in $ 000)	Pledge	Rating
General obligation				
GO and GO related	$	26,567,715	Commonwealth full faith and credit	Aa1/STA
Special Tax				
MSBA (Senior and Sub)	$	6,112,985	Dedicated statewide sales tax	Aa2/Aa3/STA
CTF	$	2,811,660	Gas taxes and registry fees	Aa1/STA
CTF Prior Obligations	$	105,230	Portion of statewide gas tax	Aa1/STA
GANs	$	748,445	Federal highway funds and sub lien on gas taxes and registry fees	Aa2/STA
Convention Center	$	552,110	Hotel occupancy tax; rental car surcharge; sales tax and sightseeing surcharge	A1/STA
MBTA Sales Tax (Senior and Sub)	$	4,235,840	Dedicated statewide sales tax	Aa2/Aa3/STA
MBTA Parking	$	304,858	Parking related revenues	A1/STA
Total net tax supported debt	**$**	**41,438,843**		

GO related debt includes Clean Water Trust revolving fund bonds rated Aaa

Source: Massachusetts FY18 CAFR; Massachusetts Information Statement; Moody's Investors Service

DEBT STRUCTURE

Massachusetts had $3.0 billion of general obligation variable rate debt outstanding or 7.3% of fiscal 2018 net tax supported debt, with nearly $1.5 billion of the variable rate bonds unhedged. Liquidity facilities contain a mix of three- and five-year term-out provisions that, considering the strength of Massachusetts' market access, should provide ample time to refinance, if necessary.

DEBT-RELATED DERIVATIVES

The commonwealth's closely managed derivatives portfolio is manageable because of liquidity that is sufficient to handle unforeseen circumstances related to its swap agreements. The agreements are floating-to-fixed hedges with a total notional amount of $1.1 billion across general and special obligation debt. The mark-to-market value was -$120.9 million as of June 30, 2019.

PENSIONS AND OPEB

The commonwealth's unfunded long-term liabilities are some of the highest in the nation and the state's contributions are consistently below the amount necessary to prevent the current liability from growing, posing a credit challenge over the longer term.

Based on the commonwealth's fiscal 2018 pension data, Massachusetts' adjusted net pension liability (ANPL) was $81.2 billion or 228% of revenue. The 50-state median ANPL to revenue is 92%, with the commonwealth ranking sixth highest in the nation. The commonwealth participates in three pension plans, of which the most significant is the State Teachers Contributory Retirement System. Massachusetts is among approximately twelve states that take responsibility for directly funding teacher pensions.

While the commonwealth contributes more than the full amount of its actuarially determined contribution annually, the state's contributions are consistently below an amount necessary to prevent the unfunded liability from growing each year, reaching only 78% of our "tread water" benchmark in fiscal 2018. Massachusetts law requires that the schedule of pension contributions be updated every three years. Pursuant to a new triennial schedule adopted in January 2020, pension payments will increase by approximately 9.6% in fiscal 2021.

In 2008 the state created a trust fund to account for its other post-employment benefit (OPEB) plan. The commonwealth's reported OPEB liability as of fiscal 2018 was $16.7 billion, slightly above Moody's adjusted net OPEB liability of $15.9 billion. The state contributions are set by statute, though the trust fund also receives annual distributions, primarily from tobacco settlement proceeds.

ESG considerations

Environmental

The US states sector overall has low exposure to environmental risks because of states' large and diverse economies, revenue-raising ability and federal government support for disaster recovery costs. Massachusetts' environmental risk exposure is above average, however, because the vast majority of its economic activity is concentrated along its coastline, with notable exposure to storms, flooding and future sea level rise.

According to the Bureau of Labor Statistics, close to a quarter of Massachusetts' wages are earned in hurricane storm surge flood zones and nearly 85% of the exposure is located in zones vulnerable to the two lowest categories of storms. This exposure reflects the state's economic engine, Boston (Aaa stable) and its location on the coast. Altogether, more than 80% of the commonwealth's GDP is located in its coastal counties, far exceeding the 50-state median of 38.6% and ranking Massachusetts' economy more at risk by this measure than Florida (Aaa stable) or California (Aa2 stable).

Massachusetts' risk of storm damage, flooding and rising sea levels on a relative basis because of climate change also ranks highly compared to other states. According to data from Moody's affiliate Four Twenty Seven, Massachusetts counties' average projected rate of change in five climate risk factors, when weighted by county GDP, is third highest in the nation, behind Florida and Rhode Island (Aa2 stable). While none of the state's counties (or cities) fall into the highest exposure category of the Four Twenty Seven data, its heavy GDP concentration in the moderate-risk Boston area results in a higher overall climate change exposure ranking versus most other states.

Recognizing that it has above-average climate risks, the commonwealth is leading climate change preparedness, resiliency and mitigation efforts for itself and its local governments. The state is conducting vulnerability preparedness planning with its municipalities and last year the governor introduced legislation to fund investment in resiliency infrastructure with $100 million in new, annual revenue from a deed excise tax. The funds would be used for strategic land acquisition and other resiliency projects across the state.

Social

Social issues, such as demographics, labor force, income and education, are key influencers of all state economies, financial and leverage trends, and governance stability. The commonwealth benefits from a highly educated workforce and elevated income levels. This contributes to the state's attractiveness to businesses looking to relocate or expand, especially in the greater Boston region, which helps boost the state's economy. For more information on social factors, please see our Economy section.

Governance

Governance is a material consideration for the sector and all of the state's ratings. Massachusetts' financial practices are generally very strong, including consensus revenue estimating, multiyear financial plans/five year forecast. Late budgets are common, but the delays typically result from a multilayered approval process that requires three separate budgets to be combined into one final document. Interim budgets are put in place to ensure continuing operations and payment of debt service.

Reserves have been growing significantly in recent years, as the commonwealth is required to deposit the entire year-end surplus and any tax revenue from excess capital gains into the Stabilization Fund, with 5% of the excess capital gains taxes deposited then transferred to the State Retiree Benefits Trust Fund and 5% transferred to the commonwealth's Pension Liability Fund. The commonwealth is also required to deposit certain one-time settlements and judgments into the Stabilization Fund.

The governor has the authority to cut expenses without legislative approval if there is a revenue shortfall. To address the aforementioned climate change concerns, the state is conducting vulnerability preparedness planning with its municipalities and looking for ways to fund multiple resiliency projects across the commonwealth to mitigate the risks.

GO rating methodology and scorecard factors

The US States and Territories methodology includes a scorecard, which summaries the 10 rating factors generally most important to the state and territory credit profiles. Because the scorecard is a summary, and may not include every consideration in the credit analysis for a specific issuer, a scorecard-indicated outcome may or may not map closely to the actual rating assigned.

Massachusetts' Aa1 rating is one notch higher than its scorecard-indicated outcome, because it incorporates the long-term economic growth that has provided the commonwealth with a strong base for paying its outsized liabilities, as discussed in this credit opinion.

Exhibit 8

US states and territories rating methodology scorecard

Massachusetts (Commonwealth of)

Rating Factors	Measure	Score
Factor 1: Economy (25%)		
a) Per Capita Income Relative to US Average [1]	130.6%	Aaa
b) Nominal Gross Domestic Product ($ billions) [1]	$505.8	Aaa
Factor 2: Finances (30%)		
a) Structural Balance	Aa	Aa
b) Fixed Costs / State Own-Source Revenue [2]	23.1%	Baa
c) Liquidity and Fund Balance	Aa	Aa
Factor 3: Governance (20%)		
a) Governance / Constitutional Framework	Aa	Aa
Factor 4: Debt and Pensions (25%)		
a) (Moody's ANPL + Net Tax-Supported Debt) / State GDP [2] [3]	20.9%	A
Factors 5 - 10: Notching Factors [4]		
No adjustments	0	
Rating:		
a) Scorecard-Indicated Outcome		Aa2
b) Actual Rating Assigned		Aa1

[1] Economy measures are based on data from the most recent year available.
[2] Fixed costs and debt and pension measures are based on data from the most recent debt and pensions medians report published by Moody's.
[3] ANPL stands for adjusted net pension liability
[4] Notching factors 5-10 are specifically defined in the US States and Territories Rating Methodology.
Source: US Bureau of Economic Analysis, Massachusetts CAFRs, Moody's Investors Service

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