

CREDIT OPINION

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New York (City of) NY

Update to credit analysis following upgrade to Aa1

Summary

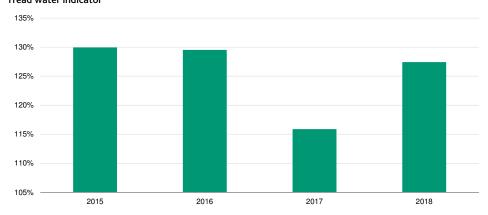
New York City's credit profile reflects continued strengthening and diversification of the city's economy, reducing its reliance on volatile financial services. The city's significant competitive advantages include a young and highly skilled labor pool, top-notch higher education and medical centers, strong domestic and international transportation links, and low crime rates. These fundamentals position New York City for strong future growth, especially in media, medical research, and technology, while maintaining its deep strength in financial services. On March 1 we upgraded the City of New York's general obligation rating to Aa1 from Aa2.

The city's credit profile also benefits from ongoing strong financial management and steady improvement in its financial position that reflect greater flexibility to react to the next downturn. Budgetary management is strong, with frequent updates to multi-year financial plans providing a transparent view of future budget pressures. New York City's revenue base is large and diverse, and its financing responsibilities are broader than most local governments, since it is a city, five counties and the nation's largest school district. The city's above-average debt burden reflects this broader operational scope. Still, the city's fixed costs for debt service, pensions and retiree health care have decreased and are now below the median for the largest local governments and in the bottom five among the nation's largest cities.

Exhibit 1

New York City's pension contributions routinely are more than the "tread water" amount needed to keep its net pension liability from growing

Tread water indicator



Years are New York City fiscal years, July-June. The tread water indicator is the amount that would cover interest on beginning-of-year net pension liability (reported NPL), plus employerservice cost accruals during the year Source: Moody's Investors Service

Credit strengths

» Exceptionally large and diverse economy driven by city's position as an international center of financial services, media, hospitality, and a growing high tech sector

- » Strong governance and financial best practices, including conservative revenue forecasting, tested through periods of fiscal stress, and strong liquidity
- » Strong pension funding practices

Credit challenges

- » Fixed costs that require continued long-term economic and revenue growth to remain affordable
- » Potential for cyclical changes in the financial services industry to impact the broader economic base
- » Ongoing need to close forecasted future year budget gaps
- » Growing susceptibility to climate risks, including from storms, rising sea levels and extreme heat

Rating outlook

The outlook for the City of New York is stable. The city's institutionalized budgetary controls and early recognition of future budget pressure help it maintain a balanced financial position and weather economic downturns. The city's economy continues to diversify, becoming less reliant on a volatile financial services sector. Pension funding practices are strong, but retiree health care liabilities are a challenge that will require ongoing economic growth to keep pace with.

Factors that could lead to an upgrade

- » Stronger reserves, at levels similar to higher-rated peers, or establishment of formal policies to increase reserves
- » Reduction of debt burden or further reduction in fixed costs

Factors that could lead to a downgrade

- » Divergence from well-established fiscal practices and strong budgetary management
- » Emergence of significant liquidity strain, especially that results in the need for large cash-flow borrowing
- » Negative change in economic fundamentals outside normal economic fundamentals

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

Key indicators

Exhibit 2

New York City	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Total Full Value (000s)	858,102,400	906,273,800	969,430,400	1,064,244,500	1,149,208,800
Full Value Per Capita	102,707	107,547	115,042	126,294	135,809
Median Family Income as % of US	99.1%	99.2%	103.4%	102.6%	N/A
Operating Revenue (000S)	72,387,292	77,608,673	79,487,118	83,287,642	87,822,094
Available Fund Balance as a % of Revenue	6.1%	9.8%	11.2%	10.6%	10.7%
Cash Balance as a % of Revenue	16.4%	17.4%	17.9%	14.6%	12.8%
Net Direct Debt (000's)	68,940,172	69,071,880	69,457,542	72,620,832	76,014,854
Net Direct Debt to Operating Revenue (x)	1.0x	0.9x	0.9x	0.9x	0.9x
Net Direct Debt as % of Full Value	8.0%	7.6%	7.2%	6.8%	6.6%
Moody's ANPL (3-Year Average) to Full Value (%)	11.2%	11.1%	11.9%	11.8%	11.4%
Moody's ANPL (3-Year Average) to Operating Revenues (x)	1.3x	1.3x	1.4x	1.5x	1.5x

Source: City of New York, Bureau of the Census, Moody's Investors Service

Profile

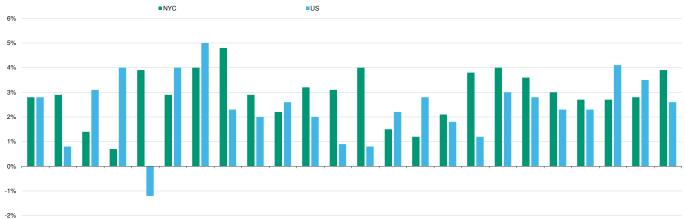
New York City, the largest city in the United States, is large and diverse, with a population of 8.6 million people and above average wealth levels: personal income per capita is 137% of the US level. The size and scope of the city's operations are broader than most local governments: in addition to the city government, New York City is five counties and the nation's largest public school system, with 1.1 million students. New York City's GDP is larger than all but four states.

Detailed credit considerations

Economy and tax base: large, robust and diverse

New York City's economy is notably large for a local government, with real GDP greater than all but four states. The local economy has expanded strongly in the last five years, exceeding US growth in 13 of 23 quarters. The expansion continued strongly though 2018, with fourth quarter growth of nearly 4% (see Exhibit 3) and 3% for the year.

Exhibit 3
Economic growth continues at a strong pace
Real GDP growth compared to same quarter in prior year



2013 Q1 2013 Q2 2013 Q3 2013 Q4 2014 Q1 2014 Q2 2014 Q3 2014 Q4 2015 Q1 2015 Q2 2015 Q3 2015 Q4 2016 Q1 2016 Q2 2016 Q3 2016 Q4 2017 Q1 2017 Q2 2017 Q3 2017 Q4 2018 Q1 2018 Q2 2018 Q3 2018 Q4 Source: New York City comptroller; Bureau of Economic Analysis

Even though the expansion is longer than typical, New York City's long-term economic prospects are strong. Employment growth and personal income growth both are outpacing the nation (see Exhibits 4 and 5), driven by strong private sector hiring. Much of the recent growth, however, has been in lower paying health care and hospitality jobs, but increases in the minimum wage (to \$15 by the end of 2019) will continue to support income growth.

Exhibit 4

Job growth in New York City outpaces the nation...

Nonfarm employment growth compared to prior year

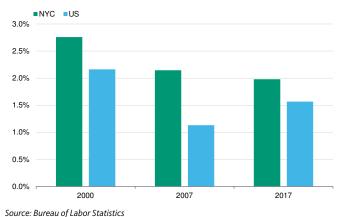
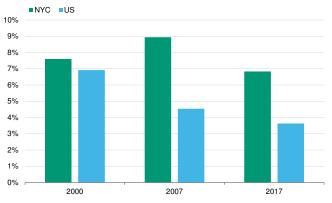


Exhibit 5
... and so does personal income
Per capita personal income growth compared to prior year

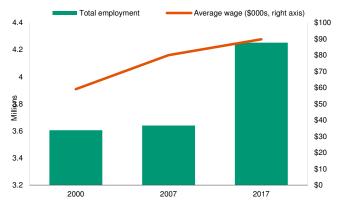


Source: Bureau of Economic Analysis

Other important sectors will continue to drive the city's economy going forward. Financial services account for nearly 11% of New York City's employment and played a key role in helping it regain jobs following the early 2000s recession at a pace faster than the nation. Job growth in the financial investment and related activities sector can be volatile and wages account for 19% of the total, according to the New York State Department of Labor. However, that is down from 25% in 2007, a signal both of changes in that industry but also of the city's diversifying economy.

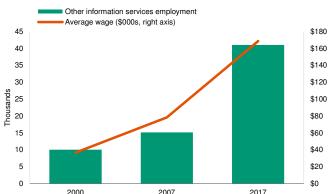
The technology sector, in particular, is leading this change. High tech jobs in the last ten years have both increased the fastest of any other category and seen the fastest wage growth (see Exhibits 6 and 7). The growth is in not only traditional technology jobs but also reflects financial services and media companies transforming themselves to stay competitive in the future. That illustrates New York City's competitive advantages that are attractive to companies like Amazon (A3 positive), Facebook, Google, and others, with large workforces in the city. New York City has a younger workforce than the US as a whole — almost 66% of the population is between 25 and 54 years old — and also a more educated one: 36% of New York City residents have a bachelor's degree or higher, compared with 30% for the US overall. The political opposition that derailed Amazon's plan to build its second headquarters in the city and may make firms that want government incentives think twice about it as a location. However, the trajectory of the fundamentals that attracted Amazon in the first place are unchanged.

Exhibit 6
New York City Jobs and wages are growing strongly...



Source: New York State Department of Labor

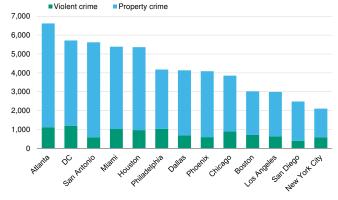
Exhibit 7 ... but tech sector jobs and wages are skyrocketing



Source: New York State Department of Labor

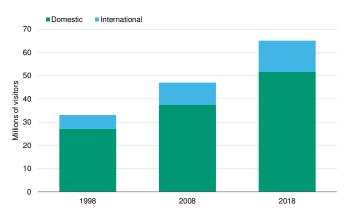
Other competitive factors help drive New York City's economy. It has the lowest per capita crime rates among the big US cities, which has helped nearly double tourism over the last 20 years (see Exhibits 8 and 9). Vacation and business travelers generate more than \$4 billion in annual tax revenue for the city, and the travel and hospitality-related sector accounts for 8% of the city's economy, its tourist bureau says. In addition, transport links within New York City, to other US cities and to international destinations are among the most extensive in the US.





Source: Federal Bureau of Investigation, Crime in the United States, 2017

Exhibit 9 ... especially tourism



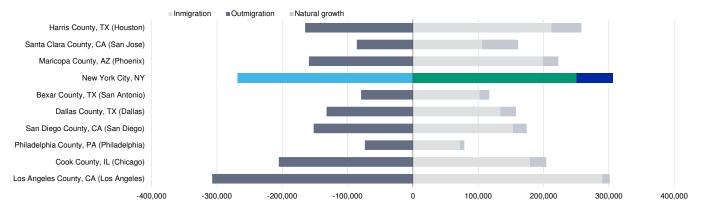
Source: New York City and Company

While New York City's population has reached a record high 8.6 million, average annual growth is slow at less than 1%. Nearly as many people move to New York City as leave it (see Exhibit 10), a trend that reflects the high costs of living in the city as well as trends of family formation on preferences of where to live. A baby boom in the city between 2011 and 2015 (ages 0-4) has driven the city's elementary school-age (ages 5-9) population today. Growth in that school age population is positive but slow, and reflects in part families leaving for the suburbs: of the ten counties that receive the most New York City out-migrants, eight are in the metro area.

Exhibit 10

Nearly as many people move to New York City as leave it, but natural growth drives positive trend

Components of population change, 2011-2015



New York City data reflect aggregation of its five counties. Source: Bureau of the Census

Environmental considerations

New York City faces growing <u>environmental risks</u> from storm events, rising sea levels and extreme heat and has initiated resilence and adaptation strategies to begin to confront them. The cost of infrastructure improvements to increase climate resiliency over the next

several decades will be significant but the investments are both manageable and essential to maintain the city's strong, <u>competitive</u> economy.

New York City is located between two tidal rivers and abuts the Atlantic Ocean. It is entirely "coastal" as defined by the National Oceanic and Atmospheric Administration (NOAA) and thus has above-average flood risk. While only 6.2% of the city's housing stock is in the floodplain, those data understate its storm risks. In addition, all 14 of its wastewater treatment facilities, 12 of 27 power plants, 16% of all hospital beds and a significant portion of public housing are in the floodplain. Superstorm Sandy in 2012 caused an estimated \$47 billion in damage across the region it hit (which was broader than just New York City) and \$26 billion in lost economic output. New flood maps that reflect the Sandy experience and other scientific and technical improvements are expected in 2021 and likely will show more of the city at flood risk. That, in turn, will require more property owners to buy flood insurance, and could also slow growth in property values.

In addition to economic loss, Sandy cost the city an estimated \$10.4 billion for emergency response and capital repair (including the New York City Housing Authority and NYC Health + Hospitals). To mitigate its environmental risks, the city is undertaking a 10-year \$20 billion plan to protect infrastructure against natural disasters, especially coastal flooding, which will mostly be paid for with federal funds (see Exhibit 11).

Exhibit 11

New York City expects the bulk of resiliency funding to come from federal government (\$ billions)

	City funds
City capital expenditures	\$6.5
	Federal funds
FEMA and other federal disaster aid	\$10.4
Community Development Block Grants; Stafford Act mitigation grants	\$4.4
Other federal aid*	\$1.6

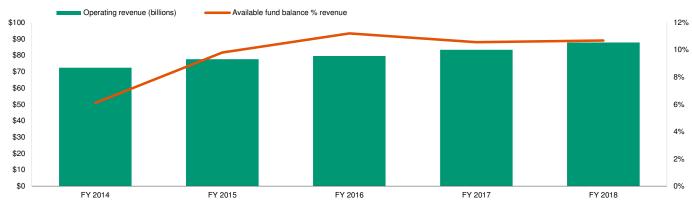
^{*} Includes federal funds that may not flow through the city's budget that are used for mitigation projects, such as via the Army Corps of Engineers Source: City of New York

Since Sandy the city has completed the equivalent of 25 miles of various types of coastal defenses, including hardened boardwalks that also serve as storm barriers and provide better drainage infrastructure. Similarly, building codes were updated to encourage greater storm resilience based on preliminary new flood maps and the city says since Sandy, 21.5 million square feet of buildings have been upgraded to better mitigate storm risk. Private utilities that operate in the city also are investing heavily in hardening or elevating their infrastructure.

Financial operations and reserves: steady improvement reflects greater flexibility to react to next downturn

New York City has bolstered its reserves in recent years to stronger levels than they've been during the last several economic downturns (see Exhibit 12). Reserves in the city's GAAP-basis budget total \$1.25 billion, reflecting \$1 billion in the General Reserve and a \$250 million pay-as-you-go capital reserve, as well as \$4.5 billion in the Retiree Health Benefits Trust that can be used to temporarily relieve the budget of the pay-as-you-go costs of these benefits. While the GAAP-basis budget only permits a narrow surplus, on a budgetary basis the city typically has significant surpluses. For fiscal 2018 that amount was nearly \$4.6 billion. The recurring budget surpluses are used to pre-pay a portion of succeeding years' debt service costs.

Exhibit 12 **Both reserves and revenues continue to grow**



Source: City of New York, Moody's Investors Service

New York City has a broader revenue structure than most local governments. While the majority of tax revenue comes from the property tax, the city also collected personal income taxes, sales taxes, and a variety of corporate, recordation, and other taxes (see Exhibit 13). The city also has a broader scope of operations than most local governments (see Exhibit 14), including a portion of Medicaid costs (shared with the state) and higher education through the junior colleges of the <u>City University of New York</u> (Aa2 stable).

Exhibit 13

New York City's tax revenues are broader than most local governments...

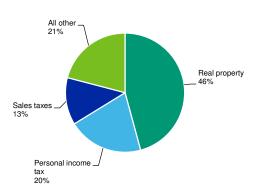
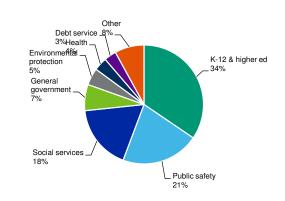


Exhibit 14 ... and so are its operations



Source: City of New York Source: City of New York

Revenue estimates are conservative, especially helpful in the current year as personal income taxes reflect a combination of impact from last year's federal tax code overhaul and market volatility (see Exhibit 15). Last year, personal income taxes increased by 21%, reflecting higher estimated payments and strong bonus withholding. Income tax collections for the current year are expected to decline by 7%, a shift largely already in the forecast. Estimated payments are expected to return to normal levels going forward, while wage withholding will reflect ongoing strong employment growth. Property tax collections are highly predictable because changes in assessed value are phased-in over five years, blunting real estate market swings.

Expenditure growth is forecasted at a moderate pace, averaging 2.7% per year (see Exhibit 16). The city's forward-looking four year financial plan also allows it to identify budget pressures early and begin to find solutions. No gap is forecasted for the current year or fiscal 2020. Gaps in later years are low percentages of total revenue (see Exhibit 17).

Exhibit 15

Conservative revenue estimates are an important aspect of New York City's strong budget management

	2019	2020	2021	2022	2023
Real property	6.3%	6.0%	4.7%	4.0%	3.0%
PIT	-7.0%	4.4%	2.4%	3.2%	3.5%
Sales	4.9%	4.6%	3.3%	3.6%	3.2%
Total	2.7%	3.7%	2.9%	3.3%	2.9%

Source: City of New York

Exhibit 16

Expenditure growth is moderate...

Forecasted year-over-year expenditure growth

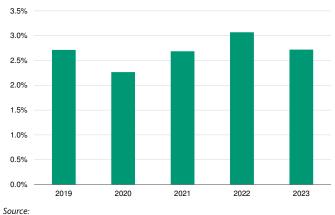
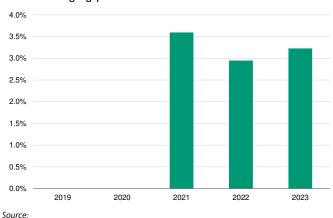


Exhibit 17
... and future year budget pressure is manageable
Forecasted budget gaps as % of total revenue



The city has subsidized its large public hospital system, New York City Health + Hospitals (H+H, officially the Health and Hospitals Corporation) since it was created, providing both operating and capital support, as well as support for its outstanding debt. Amid increasing health care costs, declining federal reimbursements for the uninsured and underperforming patient revenue, the city has increased its operating support. This includes a formal plan to incorporate treatment of the city's uninsured and undocumented population, who are already being cared for in the city system. The plan is expected to cost \$100 million each year.

In January, the city, the New York City Housing Authority (NYCHA) and the federal Department of Housing and Urban Development (HUD) reached an agreement that will require the city to provide an additional \$1 billion in capital support over the next four years and \$200 million per year thereafter. At the same time, the agreement will help stabilize the troubled public housing authority, which is home to roughly 5% of New Yorkers. NYCHA operates 326 public housing developments across the city but is largely supported by non-city funds. Tenant rental payments, direct federal subsidies and Section 8 housing assistance payments through HUD provide 88% of NYCHA's operating budget; city funds comprise 4%. Federal funds also are the bulk of NYCHA's capital budget, but under the agreement, city capital contributions will increase from 21% to 40% of NYCHA's capital program. Existing city operating and capital support is also locked in through 2027, which somewhat limits the city's fiscal flexibility, but overall reflects only 2% of total city-funded capital commitments. In addition, new funding for the financially strained Metropolitan Transportation Authority (A1 negative) is likely to come from the city's tax base, in the form of congestion pricing or other sources.

LIQUIDITY

New York City's liquidity is strong. For the first quarter of fiscal 2019 (July-September) the average daily cash balances was \$8.9 billion, equal to 13.5% of full fiscal year city funded expenditures and nearly 10% of all funds expenditures. Through the spring the city's baseline forecast shows the balance would average \$6.7 billion, and those ratios would fall to a still healthy 10% and 7%, about the same as the prior year.

Debt and pensions: moderate overall leverage but continued economic growth needed to keep pace

Unlike most other large cities, no separate school district or county government exists that also finances New York City's capital costs, which results in a higher bonded debt load when compared to some other local governments. New York City's net debt as a percentage of full value is 7.2%, compared to 2.3% for Aa1-rated cities and 2.7% for Aa2-rated cities. However, New York City's tax base is broader than just its real estate value: unlike most property tax-dependent local governments, the city's revenue base also includes personal income taxes, sales taxes and other taxes.

DEBT STRUCTURE

The city's outstanding debt is nearly evenly split between general obligation bonds and bonds issued by the New York City Transitional Finance Authority (TFA, Aaa senior, Aa1 subordinate stable) secured by personal income taxes (and if necessary, sales taxes). It also has a small amount of appropriation-backed debt outstanding, issued by the Hudson Yards Infrastructure Corporation (Aa2 stable) to finance extension of a subway line, and smaller amounts issued by Health + Hospitals for health care facilities, the Educational Construction Fund for schools, and the Industrial Development Agency for land acquisition (see Exhibit 18). General obligation debt issuance is subject to a limit based on a five-year average of taxable full value. TFA issuance is limited by a cap in state statute, but can exceed that subject to an equivalent amount being subtracted from the general obligation limit. At the end of calendar 2018, the city's combined debt incurring authority was \$34 billion.

Exhibit 18

Debt is nearly evenly split between GO and TFA
(\$ millions)

Credit	Amount outstanding	% of outstanding
General obligation	\$38,628	51%
Transitional Finance Authority future tax secured	\$35,411	47%
Appropriation-backed	\$3,712	5%
Total	\$77,751	100%

Data are as of June 30, 2018. Appropriation-backed debt includes \$2.7 billion issued by the Hudson Yards Infrastructure Corporation; \$698 million issued by Health + Hospitals; \$231 million issued by the Educational Construction Fund, and \$77 million issued by the New York City Industrial Development Agency.

Source: City of New York

The majority of outstanding GO debt is fixed rate, with less than 20% in various floating rate modes (see Exhibit 19). In addition, 11% of outstanding TFA debt is floating rate. Counterparty risk is managed through a diverse array of liquidity providers: 16 banks provide liquidity support for general obligation variable rate debt and 13 support TFA variable rate demand debt.

The city manages its variable rate portfolio proactively to renew or replace expiring liquidity facilities or to convert variable rate bonds to fixed rate or other interest rate modes if necessary. In an effort to reduce its overall borrowing costs and mitigate bank exposure, the city has converted some variable rate demand bonds to floating rate index modes (all of which are based on SIFMA). Those bonds do not have the put risk associated with demand debt but the city must refinance most of them at specific dates or interest rates will step up to higher levels. Those risks are highly manageable given the city's record of market access. The city has no LIBOR-based debt, mitigating the need to do refinancings before that rate's termination in 2021.

Exhibit 19
Most general obligation debt is fixed rate, floating rate risks are minimal (\$ millions)

	Fixed Rate	VRDBs	Index Rate	Auction Rate	Total
Outstanding	\$31,291	\$5,135	\$846	\$635	\$37,907
% total	83%	14%	2%	2%	100%

Data are as of December 31, 2018. Totals reflect rounding. Source: City of New York

DEBT-RELATED DERIVATIVES

The city has seven outstanding interest rate swap agreements associated with its general obligation bonds, with four separate counterparties. The swap portfolio's potential risks to the city are minimal: rating triggers that would cause the agreements to terminate early or post collateral are low, ranging between Baa1 and Baa3. As of December 31, 2018 the combined outstanding

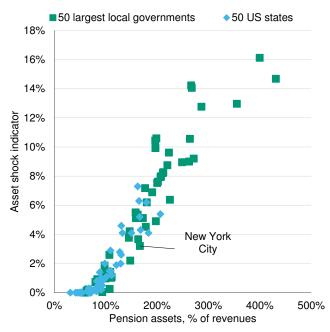
notional amount of the swaps was \$1.1 billion, with a mark-to-market value of -\$55 million. Three of the city's swaps will be outstanding when LIBOR is terminated, and the payments the city receives are LIBOR-based. The city expects the transition to a new common swap reference rate will not pose much risk.

PENSIONS AND OPEB

New York City's adjusted net pension liability (ANPL) is in the lower half of the 50 largest local governments equaling 157% of operating revenue in fiscal 2017, and declining to 135% in fiscal 2018. Strong pension funding practices include routinely contributing in excess of the "tread water" amount needed to keep the city's net pension liability from growing, under reported assumptions: in fiscal 2018, the city contributed 127% of the tread water amount (see Exhibit 1 on page 1). The city's pension system includes three multi-employer cost-sharing plans (the New York City Employees Retirement System, Teachers Retirement System, and Board of Education Retirement System), and separate plans for fire and police.

Volatility in the city's pension assets is low, relative to the size of the city's governmental revenues and its pension assets, illustrated by our pension asset shock indicator (see Exhibits 20 and 21). This is in part because the city uses a relatively low 7% assumed investment rate of return.

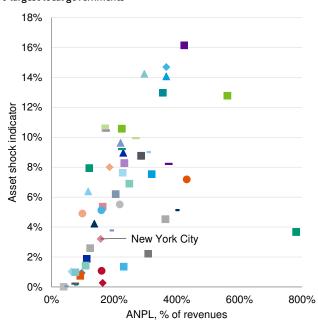
Exhibit 20 New York City's risks from pension asset volatility are low relative to the size of its revenues...



The pension asset shock indicator estimates the probability of a pension investment loss equaling 25% of a governments revenues. The indicator is a function of the size of pension assets relative to government revenues and estimated annual volatility of the asset portfolio.

Source: Moody's Investors Service

Exhibit 21 ... and the size of its adjusted net pension liabilities 50 largest local governments

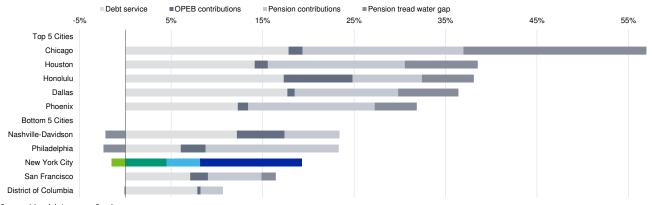


Source: Moody's Investors Service

Retiree health care liabilities (OPEB) are a challenge for New York City. The city's adjusted net OPEB libility is 90% of operating revenue (on a reported basis it is more than 100%) and nearly 7% of full value. While the city has OPEB assets equal to nearly two years' payas-you-go amount, they serve more as a budget reserve than as true pre-funding of its liability, and we do not expect that to change.

Nonetheless, New York City's fixed costs for debt service, pensions and OPEB contributions are in the bottom one-third of the 50 largest local governments, and the bottom five of the largest cities (see Exhibit 22). Using our tread water metric, New York City's fixed costs were 16% of fiscal 2018 revenues, down from 18% in fiscal 2017.

Exhibit 22
Compared to the largest cities, New York City's fixed costs are low



Source: Moody's Investors Service

Management and governance: strong financial management practices

The city's financial management is characterized by strong, institutional financial management practices that emerged from the 1970s fiscal crisis, and substantial transparency of its financial operations. The hallmark of these practices is quarterly updates to the city's five-year financial plan, including consistently conservative revenue estimates, which gives a clear forward-looking view to potential budget challenges. By law, changes in property tax billable assessed value are phased-in over five years, which evens out ups and downs in the city's real estate markets and helps minimize swings in the city's tax revenues. State law that limits the amount of real property tax that a municipality may levy in any year—a factor in our institutional framework for New York cities—does not apply to New York City. Proposals from time to time would extend the limitation to the city and if enacted, would significantly constrain the city's financial flexibility.

State law requires that the real property tax—which is used to pay general obligation debt service—is segregated into a general debt service fund held by the state comptroller. The state also statutorily covenants not to impair the rights of city bondholders to be paid when due. Those features do not create a statutory lien on the property tax in favor of GO bondholders, but are strengths in the payment mechanism that are not found in most local government general obligation bonds. In addition, the financial plan and quarterly reports on the city's interest rate derivatives are submitted to a state oversight board. The city also typically is an early-adopter of new accounting standards, which aids in transparency of how those changes will affect the city's bottom line.

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