

Rating Report

Ontario Teachers' Pension Plan Board and Ontario Teachers' Finance Trust

DBRS Morningstar

June 2, 2023

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Clara Vargas

Senior Vice President
Canadian Structured Finance
+1 416 597-7473
clara.vargas@dbrsmorningstar.com

Ranuj Kumar

Assistant Vice President
Canadian Structured Finance
+1 416 597-7597
ranuj.kumar@dbrsmorningstar.com

Sarah Bialas

Senior Vice President - Credit Ratings Legal
Canadian Structured Finance
+1 416 597-7442
sarah.bialas@dbrsmorningstar.com

Tim O'Neil

Managing Director
Canadian Structured Finance
+1 416 597-7477
tim.oneil@dbrsmorningstar.com

Ratings

Issuer	Debt	Rating	Rating Action	Trend
Ontario Teachers' Pension Plan Board	Issuer Rating	AAA	Confirmed	Stable
Ontario Teachers' Finance Trust	Long-Term Notes	AAA	Confirmed	Stable
Ontario Teachers' Finance Trust	Canadian Short-Term Promissory Notes	R-1 (high)	Confirmed	Stable
Ontario Teachers' Finance Trust	U.S. Commercial Paper Notes	R-1 (high)	Confirmed	Stable

Rating Update

DBRS Limited (DBRS Morningstar) confirmed the Issuer Rating of the Ontario Teachers' Pension Plan Board (Ontario Teachers') at AAA. DBRS Morningstar also confirmed Ontario Teachers' Finance Trust's (OTFT) Long-Term Notes, Canadian Short-Term Promissory Notes, and U.S. Commercial Paper (CP) Notes ratings at AAA, R-1 (high), and R-1 (high), respectively. All trends remain Stable. The ratings are supported by the strong legislative and governance frameworks that create a highly captive asset base, require the Ontario Teachers' Pension Plan (the Plan) sponsors to be responsive to deteriorations in funding status, and impose high standards of care and prudence on Ontario Teachers' board and management. The ratings are further supported by the Plan's fully funded status on a going-concern basis for 10 consecutive years, substantial net assets and liquidity, strong long-term investment returns, and low recourse debt burden.

Ontario Teachers' achieved a net return of 4.0% in 2022, outperforming its benchmark (BM) of 2.3% by 180 basis points (bps). Despite the high inflationary environment and the rapid rise in interest rates that led to losses in major stock and bond indexes, Ontario Teachers' early investment strategy to reduce exposures to fixed income asset classes in favour of ones that offer some inflation protection positioned it well to weather the inflation shock. Double-digit returns in inflation-sensitive assets and infrastructure more than offset losses in public equities, fixed income, real estate, and innovation asset classes. As a result of the net positive investment results, net assets rose by \$5.6 billion to \$247.2 billion.

Debt with recourse to Ontario Teachers' rose in 2022 to \$26.7 billion or 9.8% of adjusted net assets. During 2022, OTFT issued four senior unsecured notes, including a green bond. Recourse debt remains low compared with total net assets, providing considerable room for cyclical fluctuations in asset values. DBRS Morningstar notes that Ontario Teachers' continues to meet DBRS Morningstar criteria for CP liquidity support as outlined in the appendix to the *Rating Canadian Public Pension Funds & Related Exclusive Asset Managers* methodology titled "Self-Liquidity for Canadian Public Pension Funds and Related Exclusive Asset Managers' CP Programs." Ontario Teachers' liquidity position remains sound with sufficient same-day available funds equal to at least five business days of upcoming liabilities and

discounted assets equal to the remaining maximum authorized CP program limit, which is consistent with DBRS Morningstar's policy on backup liquidity support for pension plans and provides considerable short-term financial flexibility.

Ontario Teachers' primary challenge continues to be the Plan's demographics. The ratio of active-to-retired members has continued to track lower, standing at 1.2 times (x) in 2022, and is expected to continue to fall in the future. The aging demographics result in growing net pension payments (contributions minus benefit payments) and reduced ability to equitably offset significant investment losses through contribution increases. To help mitigate the risk of its declining active-to-retired ratio, the Plan sponsors introduced conditional inflation protection in the Plan in 2008, which promotes intergenerational equity by allowing retired members to share the risk of a funding shortfall along with active members. Furthermore, to mitigate risk relating to increasing net pension payments, Ontario Teachers' has been increasing its capital allocation to private assets, which tend to provide more predictable income.

The Plan's funded status on a financial statement basis changed to a \$41.0 billion surplus in 2022 from a \$15.9 billion deficit in 2021, mainly resulting from a 180-bp increase in the discount rate, which lowered the valuation of the pension liability. On a going-concern basis, the Plan has been fully funded for 10 consecutive years. The Plan sponsors filed the funding valuation in 2022 and classified the \$17.2 billion surplus as a contingency reserve, maintaining the average contribution rate at 11% and the 100% inflation protection on all pensions. As of January 1, 2023, the Plan had a preliminary surplus of \$17.5 billion. The January 1, 2023, valuation is not required to be filed with the regulatory authorities, but the Plan sponsors have recently elected to do so, with the surplus again being reclassified as a contingency reserve.

DBRS Morningstar expects the ratings to remain stable, given the current outlook for the Plan's funding status.

Exhibit 1 Financial Information

	For the year ended December 31				
(CAD billions)	2022	2021	2020	2019	2018
Net assets available for benefits	247.2	241.6	221.2	207.4	191.1
Surplus (deficit)	41.0	(15.9)	(36.1)	(17.3)	(1.2)
Recourse debt	26.739	25.910	21.615	16.460	14.562
- as % of adjusted net assets (%) ¹	9.8	9.7	8.9	7.4	7.1
Total net return (%) ²	4.0	11.1	8.6	10.4	2.5
BM return (%)	2.3	8.8	10.7	12.2	0.7

¹ For the purposes of this calculation, DBRS Morningstar adjusts net assets to include recourse debt.

² Total net return is net of all investment costs.

Issuer Description

Ontario Teachers' was created by the Province of Ontario (Ontario or the Province; rated AA (low) with a Stable trend by DBRS Morningstar) in 1990 as an independent organization to assume the management of the defined-benefit pension plan of teachers in the Province. The Plan is governed by the Teachers' Pension Act and subject to the Pension Benefits Act (Ontario) and the Income Tax Act (Canada) and is jointly sponsored by the Province and Ontario Teachers' Federation (OTF). OTFT is a wholly owned subsidiary of Ontario Teachers' and issues debt with recourse to the Plan. The ratings on the debts issued by OTFT are predicated on the unconditional and irrevocable guarantee provided by Ontario Teachers'.

Rating Considerations

Strengths

1. Exclusive mandate to manage pension assets

The legislative framework establishes Ontario Teachers' at arm's length from Plan sponsors and provides Ontario Teachers' with an exclusive and indefinite mandate to manage the assets and administer the benefits of the Ontario Teachers' Pension Plan.

2. Strong governance framework and sponsors

Ontario Teachers' has a strong governance framework, which provides the board and management with a high degree of independence from Plan sponsors and a clear delegation of duties and responsibilities. The Plan is jointly sponsored by the Province and OTF. Under this framework, the Funding Management Policy within the Partners' Agreement clearly outlines how funding deficiencies and surpluses are to be addressed, which provides bondholders with comfort that the Plan sponsors will be responsive to deteriorations in funding status. Moreover, the Province's involvement as a sponsor adds considerable stability and certainty to pension contributions, given its strong financial profile.

3. Low debt burden and substantial liquidity

Ontario Teachers' maintains a significant asset base and ample liquidity to meet obligations as they arise. As at December 31, 2022, Ontario Teachers' had \$247.2 billion in net assets while recourse debt was \$26.7 billion. Ontario Teachers' maintains significant cash and high-quality debt holdings and is able to access additional liquidity through committed credit lines as well as the use of repurchase agreements.

4. History of strong investment returns

Ontario Teachers' continues to show a high degree of skill in controlling risks and managing assets with enhancements made to internal risk-management systems and practices since the significant losses in 2008. Ontario Teachers' investment portfolio has generated an annualized net return of 8.5% over the last 10 years, surpassing the 7.5% BM return by 90 bps.

Challenges

1. Declining ratio of active to retired teachers

Demographics and workforce projections point toward a continued decline in the ratio of active to retired members going forward as life expectancies increase. As at YE2022, the Plan had 1.2 active teachers for every pensioner, down from 2.0 in 2000 and 4.0 in 1990. This ratio is lower than those of most other major Canadian pension funds and is expected to continue to fall in the future, which will make it increasingly difficult to address any shortfall with measures aimed at active members, such as contribution rate increases. To help mitigate the risk of its declining active-to-retired ratio, the Plan sponsors introduced conditional inflation protection in the Plan in 2008, which allows inflation protection to vary based on the financial health of the Plan. Conditional inflation protection, if fully invoked, is currently capable of absorbing an asset loss of \$54 billion as of 2022, as estimated by Ontario Teachers'.

2. Volatility inherent in investment activities and actuarial benefit obligations

Asset valuations fluctuate over time. The current outlook of high inflation, rising interest rates, the ongoing war in Ukraine, slowing economic growth, and economic uncertainty can lead to heightened volatility and lower asset valuations. A significant decline in asset valuations could result in a material erosion in the Plan's asset base. However, this challenge is mitigated by Ontario Teachers' prudent and proactive approach to risk management, focus on high-quality assets, diversified portfolio, history of strong investment results, and a low recourse debt burden that provides considerable cushion for asset base movements.

3. Legal and political risks

The AAA and R-1 (high) ratings rely heavily on the captivity of the asset base and Ontario Teachers' independence from Plan sponsors. While only a remote possibility, legislative changes or political intervention that weakens either of these factors could affect the ratings.

Investment Performance

Ontario Teachers' achieved a net return of 4.0% in 2022, outperforming its BM return of 2.3% by 180 bps. As a long-term investor, Ontario Teachers' performance is better measured on a long-term basis. Over the last decade, Ontario Teachers' has achieved an average annual return of 8.5%, exceeding its BM return of 7.5% by 90 bps.

Despite the high inflationary environment and rapid rise in interest rates that led to losses in major stock and bond indexes, Ontario Teachers' early investment strategy to reduce exposures to fixed income asset classes in favour of ones that offer some inflation protection, positioned them well to weather the inflation shock. Double-digit returns in inflation-sensitive assets and infrastructure more than offset losses in the public equities, fixed income, real estate, and innovation asset classes.

Ontario Teachers' investments in public equities and fixed income produced losses of 12.5% and 3.5%, respectively, in 2022. The loss in public equities exceeded the loss in its BM of 10.2%, in part due to Ontario Teachers' higher portfolio concentration in listed technology and healthcare companies compared with the BM composition. Losses in the fixed income portfolio were attributed to the significant increase in interest rates during the year by central banks, mitigated to some extent by some decisions made in 2021 to reduce its sensitivity to interest rate changes. In 2022, Ontario Teachers' reallocated some capital from public equities to other asset classes and increased fixed income investments by \$40.8 billion to \$86.0 billion, as fixed income investments make an attractive source of investment income and diversification in a high-interest-rate environment.

The real estate portfolio also generated a loss of 3.5% underperforming its BM gain of 6.7%. The loss in the year was attributed to the relative portfolio concentration in Canadian retail and office properties, which continued to underperform other property types included in the BM. Ontario Teachers' real estate arm, Cadillac Fairview Corporation, continues to focus on scaling and diversifying the portfolio. During 2022, Cadillac Fairview Corporation invested in multifamily, life-sciences, and industrials properties outside of Canada, which led to an increase in Ontario Teachers' real estate portfolio weight in international markets to 27% from 14% in the prior year.

Losses produced by the public equities, fixed income, and real estate portfolios were more than offset by gains delivered by the inflation-sensitive infrastructure and private equity portfolios. The infrastructure portfolio delivered an 18.7% return, outperforming its BM of 15.1%, attributed in part to increased revenues resulting from higher inflation and higher traffic volumes on toll roads, seaports, and airports. The inflation-sensitive asset class delivered a 19.2% return, outperforming its BM of 18.7%, as this asset class performed strongly in the inflationary environment. Private equities delivered a 6.1% return, outperforming its BM loss of 3.9%, driven by earnings at many portfolio companies and the appreciation of the U.S. dollar against the Canadian dollar. Private credit delivered a 3.6% return, outperforming its BM of 0.0%, mostly driven by the appreciation of the U.S. dollar, as well.

Exhibit 2 Investment Returns

	For the year ended December 31						
	10-year avg.	Five-year avg.	2022	2021	2020	2019	2018
Portfolio (%)	8.5	7.3	4.0	11.1	8.6	10.4	2.5
BM (%) ¹	7.5	6.8	2.3	8.8	10.7	12.2	0.7

¹ The total fund BM aggregates the BM returns from each of the asset-class BMs.

Exhibit 3 Investment Returns¹

	For the year ended December 31						
	2022			2021	2020	2019	2018
	Return	BM	Variance	Return	Return	Return	Return
Fixed income (%)	(3.5)	(3.5)	0.0	(6.3)	20.7	6.3	2.8
Bonds (%)	(5.9)	(5.9)	0.0	(9.4)	24.6	5.9	3.5
Real-return products (%)	7.3	7.3	0.0	(1.4)	12.8	7.5	-
Equity (%)	0.1	(5.9)	6.0	21.3	13.2	12.4	7.2
Publicly traded (%)	(12.5)	(10.2)	(2.3)	9.0	15.2	15.2	(3.6)
Non-publicly traded (%)	6.1	(3.9)	10.0	29.0	13.5	9.4	19.5
Real assets (%)	8.3	11.1	(2.8)	5.4	(7.6)	5.8	7.0
Real estate (%)	(3.5)	6.7	(10.2)	2.5	(13.7)	6.2	5.8
Infrastructure (%)	18.7	15.1	3.6	7.9	2.6	4.2	8.8
Real-rate products (%)							6.9
Inflation sensitive (%)	19.2	18.7	0.5	11.4	(2.4)	2.7	2.6
Natural resources (%)	29.6	28.2	1.4	28.1	(11.2)	2.1	7.7
Commodities (%)	19.5	19.5	0.0	7.9	4.3	8.0	(2.2)
Inflation hedge (%)	9.2	9.2	0.0	8.0	(4.4)	(3.9)	5.4
Credit (%)²	3.6	0.0	3.6	3.5	2.6	7.3	6.3
Innovation (%)³	(12.1)			39.0	16.3		
Total Plan (%)⁴	4.0	2.3	1.7	11.1	8.6	10.4	2.5

¹ Gross returns by asset class; net returns for total fund return.

² Credit asset class created in F2017; includes corporate and emerging-markets debt.

³ Innovation asset class created in F2019; focuses on emerging opportunities as a result of the unprecedented technological change.

⁴ Absolute return strategies and money markets are included in the total plan return, but their returns are not attributed to specific asset classes.

Investment and Risk Management

Investment Allocations and Strategy

Ontario Teachers' objective is to maintain stable contribution and benefit levels as well as achieve returns that, at a minimum, support the long-term sustainability of the Plan. The long-term asset allocation incorporates these requirements as well as expectations for the demographics of the Plan, expected liquidity requirements, and other portfolio-management considerations. Within the context of the long-term asset allocation, Ontario Teachers' seeks to maximize returns within the implied risk tolerance. Ontario Teachers' also continues to focus on broad diversification across asset classes and the moderate use of leverage.

In 2022, Ontario Teachers' continued to deliver on its investment strategy, which focuses on total fund returns, value-added returns, and volatility management. Management determines the asset-mix policy within board-approved risk parameters. Over the medium term, management expects to continue making small adjustments to the portfolio as it seeks to further incorporate risk-management considerations into portfolio allocations and decision-making. Ontario Teachers' continues to map the impacts of common risk factors across asset classes as well as potential impacts arising from emerging risks, such as rising interest rates, inflationary pressures, or geopolitical risk. During 2022, Ontario Teachers' made small adjustments to the asset mix to adapt to the inflationary environment. These adjustments led to an increase of its exposure to real assets, such as infrastructure, which tend to provide more reliable inflation-linked cash flows. Ontario Teachers' also increased capital allocations to developed market government bonds, provincial bonds, real-return bonds, levered loans and high-yield bonds, as these types of investments provide diversification and tend to provide attractive investment income in a high-interest-rate environment. The risk profile could evolve as Ontario Teachers' actively manages the Plan funding and investment risk together, but always within the board-approved risk parameters.

Ontario Teachers' considers the impact that environmental, social, and governance (ESG) issues may have on the Plan's financial performance in a manner that is consistent with the board's objective to meet the pension liabilities over the short-term and long-term horizon. This is consistent with DBRS Morningstar's view that pension funds that proactively address ESG risks and opportunities are expected to have stronger credit risk profiles, as ESG factors can affect their cash flows and the long-term value of their investments and therefore their ability to meet their financial obligations to bondholders. Ontario Teachers' has made several commitments that include reaching net-zero greenhouse gas emissions in its portfolio by 2050; has set interim targets to decrease the portfolio emissions intensity by 45% by 2025 and by 67% by 2030; and in 2022, introduced a strategy to invest up to \$5 billion in select emissions-intensive assets with the specific goal of using Ontario Teachers' capital and expertise to help these companies to decarbonize faster. Ontario Teachers' has also committed to achieve diversity, equity, and inclusion in the workplace through employee resource groups and partnerships with organizations such as the BlackNorth Initiative, 30% Club, Catalyst, and the Investor Leadership Network; and has added an increased focus on social governance elements in its investment decision-making.

Ontario Teachers' continues to invest in internal resources as it seeks to enhance its investment capacity and bring most asset management in-house. At present, Ontario Teachers' manages about 80% of assets in-house and uses external managers for mandates where the Plan lacks internal expertise. All external managers are overseen by Ontario Teachers' to ensure appropriate accountability.

Net Investments by Asset Class

Exhibit 4 Net Investments by Asset Class

	Long-term asset mix policy ¹		As at December 31				
	Min.	Max.	2022	2021	2020	2019	2018
Equities (%)	30.0	40.0	32.9	34.4	38.7	36.8	34.6
Fixed income (%)	0.0	67.0	35.2	18.9	15.9	45.6	41.4
Inflation sensitive (%)	15.0	25.0	19.6	20.1	16.8	17.7	14.6
Real assets (%)	20.0	30.0	27.8	21.9	20.6	22.4	26.4
Innovation (%)	0.0	7.0	3.0	3.0	1.6		
Credit (%)	5.0	15.0	14.4	10.2	8.2	8.0	8.1
Absolute return strategies (%)	4.0	14.0	7.7	6.2	6.2	8.1	6.7
Overlay (%)			(0.1)	(0.2)	0.4	0.1	(0.2)
Funding for investments (%)	(98.0)	10.0	(40.5)	(14.5)	(8.4)	(38.8)	(31.7)

¹ The asset allocation to money markets is negative because Ontario Teachers' uses short borrowings to fund investments in other asset classes.

Risk Management

Ontario Teachers' has an extensive enterprise risk framework aimed at ensuring the Plan meets its short- and long-term objectives. The board sets the overall direction for Ontario Teachers' risk-management activities through the development of key policies and risk-appetite statements and by providing oversight through its various committees. Senior management has implemented systems and internal controls to meet the policy requirements and has established a number of committees to ensure compliance and to address issues or concerns as they arise.

Investment risk management is achieved through broad diversification of risk exposures. In practice, Ontario Teachers' uses risk budgets informed by the risk-appetite statements to allocate risk across investment departments. Investment departments are responsible for adhering to their risk allocations as well as other risk-related policies and procedures. The Finance Division independently measures the investment risk exposure and provides the information to the Investment Committee of the board.

Ontario Teachers' measures total asset risk using the expected tail loss (ETL) methodology, a Value at Risk (VaR)-type approach, over a one-year horizon at a 99% confidence level. This approach is more conservative than the standard VaR at a given quantile level as it is the average of all the losses in the tail. The ETL methodology captures the investment risk exposure by asset class and reflects the risk of potential losses in net assets caused by market and credit risk factors. As at December 31, 2022, the total asset risk was measured at \$50.0 billion, lower than the \$58 billion total asset risk as at December 31, 2021.

Valuation of Private-Market Assets

Ontario Teachers' measures all of its investments at fair value in accordance with International Financial Reporting Standards and board policy. Real estate, private equities, infrastructure, timberland and natural resources are valued based on estimated fair values determined by using appropriate techniques and best estimates by either management, appraisers, or both. Private market assets, for which there is no active market, are generally valued at least annually and Ontario Teachers' seeks to ensure that valuations are reasonable through the application of multiple valuation approaches to confirm reasonableness. Investment divisions create valuation models for all major investments and the Finance department has a staff of Chartered Business Valuators to review valuations and make adjustments as necessary. Where external appraisers are engaged to perform the valuation, management ensures that the appraisers are independent. For example, within the real estate portfolio, at least 70% of the rental properties are independently appraised annually and all properties valued at more than \$250 million are independently appraised every year. The intent is to have a rigorous process with multiple layers of review/assessment to arrive at fair valuations. Ontario Teachers' also conducts back-testing and reviews underlying assumptions to ensure their appropriateness.

Liquidity Management

Liquidity risk management falls within Ontario Teachers' broader enterprise risk framework. Overall liquidity management is dictated by board-level policies seeking to ensure that Ontario Teachers' will have sufficient liquidity to meet its expected and unexpected liquidity requirements as they arise. Ontario Teachers' monitors its liquidity daily and uses a stress-test framework to estimate its liquidity needs under severe market conditions. Ontario Teachers' adopted the liquidity coverage ratio used by the banking sector but tailored it to reflect the unique characteristics of the fund. Ontario Teachers' maintains sufficient liquidity in the form of highly marketable assets, including Canadian and U.S. government bonds and publicly traded equities that are traded on major stock exchanges.

Leverage and Debt

Ontario Teachers' had investment-related liabilities of \$67.1 billion as of the end of 2022, consisting mainly of securities sold under repurchase agreements, recourse debt, and securities sold short.

Ontario Teachers' makes use of repurchase agreements to fund its investment activities and to manage day-to-day liquidity while it maintains economic exposure to the underlying securities. As at December 31, 2022, Ontario Teachers' had sold \$26.3 billion in securities under repurchase agreements and had purchased \$10.7 billion in securities under agreements to resell.

In 2015, OTFT was established for issuing debt guaranteed by Ontario Teachers'. Recourse debt, consisting of OTFT's short-term borrowing program and term debt, amounted to \$26.7 billion as at December 31, 2022, or 9.8% of adjusted net assets. OTFT's short-term borrowing programs in Canada and the United States have an authorized aggregate limit of \$10.0 billion and as at December 31, 2022, a total of \$2.6 billion was outstanding. OTFT continues to diversify funding sources by currency and by tenor, through their Global Debt Program. During 2022, OTFT issued four senior unsecured notes, one of which was a green bond. The notes were denominated in USD, EUR, and CAD, with tenors that ranged

from five to 10 years. So far in 2023, OTFT has remained active in the term market, issuing a fourth green bond (CAD 1.0 billion) and another USD 1.5 billion senior unsecured note. Including new issuance, Ontario Teachers' recourse debt remains low compared with net assets, providing considerable room for cyclical fluctuations in asset values.

OTFT's internal policies require staggering maturities of short-term promissory notes and CP and impose limits on the amounts maturing in any given one-week and four-week period. OTFT meets the DBRS Morningstar criteria for CP liquidity support outlined in the appendix to *Rating Canadian Public Pension Funds & Related Exclusive Asset Managers*. The liquidity position remains sound with sufficient same-day available funds equal to at least five business days of upcoming liabilities and discounted assets equal to the remaining maximum authorized CP program limit, which is consistent with DBRS Morningstar's policy on backup liquidity support for pension plans and provides considerable short-term financial flexibility. As an additional source of liquidity, OTFT maintains a USD 1.0 billion credit facility, which has been internally committed to backstop the short-term borrowing programs.

Ontario Teachers' uses derivatives extensively to achieve various portfolio objectives, including attaining geographic, commodity, and equity market exposure; carrying out absolute-return strategies; and hedging. Ontario Teachers' seeks to manage credit and counterparty risks related to its derivatives positions by conducting internal credit assessments, imposing counterparty concentration limits, netting through International Swaps and Derivatives Association Master Agreements for over-the-counter derivatives, and exchanging collateral through credit-support annexes.

Exhibit 5 Investment-Related Liabilities and Capital Market Debt

As at December 31 (CAD millions)	For the year ended December 31				
	2022	2021	2020	2019	2018
Securities sold short	10,718	19,174	8,238	10,817	15,110
Securities sold under repurchase agreements	26,316	25,529	14,185	19,821	28,280
Derivative-related liabilities	2,237	2,200	4,661	3,186	7,321
Cash collateral received	1,121	449	3,356	988	937
CP	2,640	2,501	3,637	8,490	8,676
Real estate debt (including debentures) ²	-	5,489	5,491	5,228	3,894
Term debt	24,099	23,409	17,212	7,187	5,091
Total	67,131	78,751	56,780	55,717	69,309
Total recourse debt	26,739	25,910	21,615	16,460	14,562
As a share of adjusted net assets (%) ¹	9.8	9.7	8.9	7.4	7.1

¹ For the purposes of this calculation, DBRS Morningstar adjusts net assets to include recourse debt.

² Effective January 1, 2022, real estate investment assets are presented on a nonconsolidated basis.

Exhibit 6 Capital Market Debt Outstanding

As at December 31, 2022 (CAD millions)	Maturity	Interest Rate (%)	Fair Value
Commercial Paper			2,640
• Canadian Short-Term Promissory Notes	< 364 days		
• U.S. Commercial Paper Notes	< 397 days		
OTFT USD 1.75 Billion Senior Notes	Sep. 2024	1.625	
OTFT USD 1.00 Billion Senior Notes	Apr. 2025	1.375	
OTFT EUR 1.50 Billion Senior Notes	May 2025	0.500	
OTFT USD 1.50 Billion Senior Notes	Sep. 2023	0.375	
OTFT USD 1.50 Billion Senior Notes	Sep. 2030	1.250	
OTFT CAD 1.25 Billion Senior Notes	Oct. 2027	1.100	
OTFT EUR 0.75 Billion Senior Notes (Green Bond)	Nov. 2030	0.050	
OTFT USD 1.50 Billion Senior Notes	Apr. 2031	2.000	
OTFT EUR 1.25 Billion Senior Notes	May 2028	0.100	
OTFT EUR 1.25 Billion Senior Notes	May 2041	0.900	
OTFT USD 2.00 Billion Senior Notes	Sep. 2026	0.875	
OTFT GBP 0.50 Billion Senior Notes	May 2026	1.125	
OTFT EUR 0.50 Billion Senior Notes (Green Bond)	Nov. 2051	0.950	
OTFT USD 1.50 Billion Senior Notes	Apr. 2027	3.000	
OTFT EUR 1.25 Billion Senior Notes	May 2032	1.850	
OTFT EUR 0.50 Billion Senior Notes	Oct. 2029	3.300	
OTFT CAD 1.00 Billion Senior Notes (Green Bond)	Jun. 2032	4.450	
Total			26,739

Funding Status and Net Assets**Financial Statements**

In 2022, net assets available for benefits rose by 2.3% to \$247.2 billion, up from \$241.6 billion the year before. Net investment income of \$10.4 billion offset net pension payments (contributions minus benefit payments) of \$3.8 billion.

The Plan's funding status on a financial statement basis changed to a \$41.0 billion surplus in 2022 from a \$15.9 billion deficit in 2021, largely driven by a decrease in the accrued pension benefits that resulted from an increase in the discount rate to 4.30% from 2.50%. The increase in the discount rate reflects rising bond yields, as the discount rate used is an average of market rates for bonds issued by the Province, weighted to reflect the estimated amount and timing of the Plan's benefit payments. The accrued pension benefits also reflect the actual January 1, 2023, inflation adjustment to pensions in pay of 6.3%, and an estimate of the January 1, 2024, inflation adjustment of 4.3%; beyond January 1, 2024, inflation adjustments to pensions in pay assume a long-term inflation rate of 2.10%.

Actuarial Funding Valuations

Ontario Teachers', like other defined-benefit pension plan administrators, is required to file an actuarial funding valuation with regulatory authorities at least triennially. The funding status established by the actuarial funding valuation differs from that used for financial statements as it includes future contributions and benefits as well as smooths investment earnings. The actuarial funding valuation provides a truer representation of the Plan's long-term sustainability and is the valuation that is used by Plan sponsors to determine whether changes in benefit levels, contribution rates, and inflation

protection are warranted. Despite rising interest rates, Ontario Teachers' board opted to keep the discount rate unchanged in the January 1, 2023, preliminary funding valuation, to be proactive in managing the relative maturity of the Plan and potential funding challenges that may arise from the current uncertain and unpredictable investment environment. This discount rate is low compared with other public-sector pension plans in Canada.

In 2008, the Plan sponsors introduced conditional inflation protection in the Plan, which allows inflation protection to vary based on the financial health of the Plan. Inflation protection can vary between 50% and 100% of the Consumer Price Index for pension credit earned between 2010 and 2013 and can vary between 0% and 100% for pension credit earned after 2013. Conditional inflation protection and changes to indexation levels can be invoked only when a valuation is filed.

On a going-concern basis, the Ontario Teachers' Pension Plan has been fully funded for 10 consecutive years.

In 2022, Ontario Teachers' filed a valuation with the regulatory authorities. The valuation established a surplus of \$17.2 billion after maintaining the indexation levels for pension credit earned after 2009 at 100%. The January 1, 2022, surplus was fully allocated to a contingency reserve to reduce volatility in the funded position of the Plan and facilitate stability in members' contributions and benefits.

The January 1, 2023, valuation established a preliminary surplus of \$17.5 billion, after maintaining the real discount rate and long-term inflation rate steady at 2.45% and 2.00%, respectively, and applying an inflation adjustment to pensions in pay at January 1, 2024, estimated at 4.3%. Although the January 1, 2023, valuation is not required to be filed with the regulatory authorities, the Plan sponsors have recently elected to do so, with the surplus again being classified as a contingency reserve.

Outlook

In comparison with other public-sector plans in Canada, the Plan is relatively mature. The ratio of active-to-retired members has fallen sharply over the last two decades as longevity improved. The challenge for Ontario Teachers' is that, as the pension plan matures, there is less ability to recover from large losses without considerable increases in contributions or reductions to benefits. Ontario Teachers' estimates that current contributions would have to rise by 5.6% to offset a funding deficit equivalent to approximately 10% of assets. To help mitigate the risk of its declining active-to-retired ratio, the Plan sponsors introduced conditional inflation protection in the Plan in 2008, which allows inflation protection to vary based on the financial health of the Plan. Conditional inflation protection, if fully invoked, is currently capable of absorbing an asset loss of \$54 billion as estimated by Ontario Teachers'.

At present, the ratio of active-to-retired members is about 1.2x and that ratio is expected to continue to fall in the future. In 2022, the average retirement age was 59 and teachers spent, on average, 32 years in retirement.

Exhibit 7 Demographics

	2022	2010	2005	1990	1970
Average retirement age	59	59	57	58	61
Expected years on pension	32	30	28	25	20
Ratio of active teachers to pensioners	1.2	1.5	1.6	4	10

Exhibit 8 Net Assets Available for Benefits and Accrued Pension Benefits

(CAD millions)	As at December 31				
	2022	2021	2020	2019	2018
Assets					
Cash	1,107	484	283	643	534
Receivable from Province of Ontario	3,298	3,234	3,179	3,146	3,224
Receivables from brokers	562	26	655	205	189
Investments	311,270	317,714	274,706	259,763	256,891
Premises and equipment	83	91	122	130	63
Total assets	316,320	321,549	278,945	263,887	260,901
Liabilities					
Accounts payable and accrued liabilities	590	693	584	563	458
Due to brokers	1,364	523	340	195	22
Investment-related liabilities	67,131	78,751	56,780	55,717	69,309
Total liabilities	69,085	79,967	57,704	56,475	69,789
Net assets available for benefits	247,235	241,582	221,241	207,412	191,112
Pension obligations	206,197	257,482	257,330	224,669	192,281
Funding surplus (deficit)	41,038	(15,900)	(36,089)	(17,257)	(1,169)

Exhibit 9 Changes in Net Assets Available for Benefits

(CAD millions)	For the year ended December 31				
Change in net assets available for benefits	2022	2021	2020	2019	2018
Net investment income	10,360	24,711	18,011	20,185	5,233
Contributions	3,367	3,354	3,232	3,223	3,166
Pension payments	(7,205)	(6,909)	(6,700)	(6,415)	(6,141)
Operating expenses	(869)	(815)	(714)	(693)	(624)
Increase (decrease) in net assets	5,653	20,341	13,829	16,300	1,634
Net assets available for benefits	247,235	241,582	221,241	207,412	191,112
Change in accrued pension benefits					
Increase in pension obligations	2022	2021	2020	2019	2018
Interest on accrued pension benefits	6,467	5,176	5,629	6,151	6,043
Benefits accrued	9,614	9,826	7,690	6,281	7,157
Changes in actuarial assumptions/methods	-	-	27,138	25,515	-
Changes in benefits/provisions	-	-	-	-	-
Experience losses	8,301	1,313	-	853	709
	24,382	16,315	40,457	38,800	13,909
Decrease in pension obligations	2022	2021	2020	2019	2018
Benefits paid	7,204	6,907	6,699	6,412	6,138
Changes in actuarial assumptions/methods	68,463	9,256	-	-	19,812
Experience gains	-	-	1,097	-	-
	75,667	16,163	7,796	6,412	25,950
Net increase in pension obligations	(51,285)	152	32,661	32,388	(12,041)
Accrued pension benefits	206,197	257,482	257,330	224,669	192,281

About Ontario Teachers'

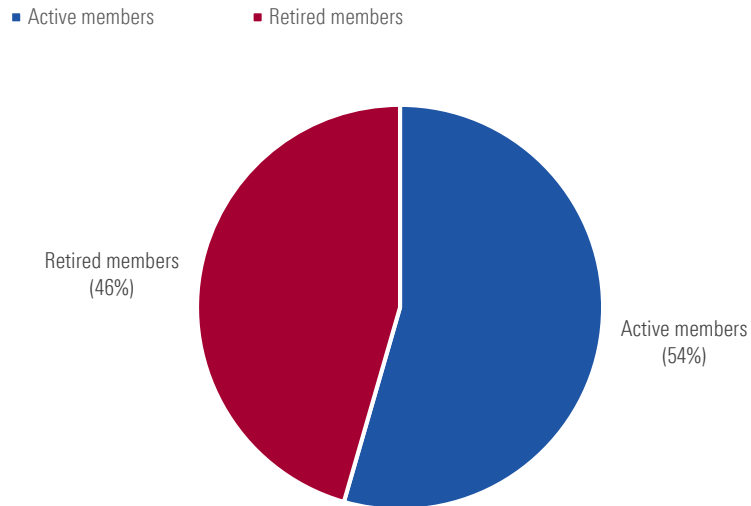
Ontario Teachers' has managed the contributory defined-benefit pension plan for Ontario teachers since its creation on January 1, 1990. The Plan is governed by the Teachers' Pension Act and subject to the Pension Benefits Act (Ontario) and the Income Tax Act (Canada).

Ontario Teachers' Pension Plan

The pension plan is mandatory for all district school board teachers and those from designated private institutions in Ontario. The Plan works with the Canada Pension Plan (CPP) to provide pensioners with annual benefits equal to 2% per year of service multiplied by the average of the member's best five annual salaries. The Plan provides bridging for those who retire before the age of 65 and, when CPP payments commence at 65, pension payments are reduced accordingly. The Plan also provides inflation protection. Pension credit earned prior to 2010 is fully indexed while pension credit earned in 2010 and subsequent years is subject to conditional indexation, whereby the cost-of-living adjustment is contingent on the funded status of the Plan. When the Plan is in surplus, the sponsors can restore inflation protection for previously unrecognized inflation. In prior years, the Plan sponsors have restored post-2009 inflation protection to 100% because of recurring surpluses.

The Plan has 336,000 members, 183,000 of which are active members and 153,000 are retired members. The Plan is maturing and the ratio of active-to-retired members has been tracking lower, reaching 1.2x in 2021, down from about 2.0x in 2000. In addition, teachers tend to retire relatively younger at an average age of 59 years and tend to live longer than the general population.

Exhibit 10 Ontario Teachers' Pension Plan (as of December 31, 2022)



The Ontario Teachers' Pension Plan is jointly sponsored by the Province and Plan members as represented by OTF. The sponsors are responsible for ensuring that the Plan is fully funded over the long term. They share responsibility for any funding surplus or deficiency as well as setting contribution rates and benefit levels. Ontario Teachers' provides the sponsors with analytical and actuarial support for decision-making related to the Plan. Decisions are made jointly by the sponsors.

The Funding Management Policy, contained within the Partners' Agreement, sets out a framework for addressing funding surpluses and deficiencies as well as establishes a 10% cushion, restricting the ability of Plan sponsors to improve benefits or reduce contribution rates when the funding status is less than 110%. The intent of this is to provide a buffer against possible market downturns. Contribution rates are currently 10.4% up to the yearly maximum pensionable earnings (YMPE) threshold for the CPP and 12.0% for earnings above the YMPE.

Ontario Teachers' Governance

Ontario Teachers' is governed by an 11-member board with five members selected by the Province, five members selected by OTF, and the chair jointly selected. The professional board comprises individuals with significant executive-level experience in a range of industry sectors, including investment management, finance, business, actuarial science, economics, accounting, and education. Board members can serve up to four consecutive two-year terms.

The board is required to act independently of both the sponsors and management and to make decisions in the best interest of the Plan's beneficiaries. While day-to-day management of the Plan is delegated to senior management, the board remains responsible for providing management oversight, strategic planning, ensuring that there are adequate internal controls and risk-management systems, developing and approving corporate governance policies, developing appropriate investment policies, and preparing actuarial valuations. The board operates through the following six board subcommittees: the Human Resources & Compensation Committee, the Governance Committee, the Audit & Actuarial Committee, the Investment Committee, the Benefits Adjudication Committee, and the Enterprise Risk Committee.

Ontario Teachers' has a strong and stable management team as many members of senior management have been with the organization for many years.

Ontario Teachers' has offices in Toronto, London, Hong Kong, and Singapore and opened two new offices in 2022 in Mumbai and San Francisco, which will enable the expansion of Ontario Teachers' footprint into targeted international markets. Ontario Teachers' directly employs 1,300 staff members. Cadillac Fairview Corporation, Ontario Teachers' real estate subsidiary, employs a further 1,400 staff members.

Ranking and Guarantees

The Teachers' Pension Act is silent on the ranking of counterparty obligations relative to pension obligations in the event of a windup; however, in 2015, Ontario Teachers' sought to provide greater clarity on ranking. In a schedule to the Teachers' Pension Act, which contains the detailed provisions of the Plan, a section was added that states that, in the event of a windup (as defined in the Pension Benefits Act (Ontario)), the assets of the pension fund would first be used to pay or satisfy properly incurred liabilities to creditors. The provision is consistent with a legal opinion Ontario Teachers' obtained when developing its short-term borrowing program in late 2015. While this is a positive development, DBRS Morningstar generally puts limited emphasis on legal opinions and Plan provisions, given the absence of legal certainty pertaining to the issue.

Ontario Teachers' unconditionally guarantees, by way of separate guarantees, the full payment of principal and interest for the short-term notes and long-term debt of OTFT. The guarantees are unconditional, cannot be revoked for any reason, and will continue until the debts are repaid. DBRS Morningstar has reviewed legal opinions confirming that the guarantees provided by Ontario Teachers' on the debt issued by OTFT are enforceable and are in accordance with legislation and Ontario Teachers' bylaws.

Rating History

	Current	2022	2021	2020	2019
Ontario Teachers' Pension Plan Board					
- Issuer Rating	AAA	AAA	AAA	AAA	AAA
Ontario Teachers' Finance Trust					
- Long-Term Notes	AAA	AAA	AAA	AAA	AAA
- U.S. Commercial Paper Notes	R-1 (high)	R-1 (high)	R-1 (high)	R-1 (high)	R-1 (high)
- Canadian Short-Term Promissory Notes	R-1 (high)	R-1 (high)	R-1 (high)	R-1 (high)	R-1 (high)

Related Research

- *Rating Canadian Public Pension Funds & Related Exclusive Asset Managers* (April 27, 2023).
- *North American Structured Finance Flow-Through Ratings* (November 22, 2022).

Commercial Paper Limit

- \$10 billion.

Previous Report

- Ontario Teachers' Pension Plan Board and Ontario Teachers' Finance Trust: Rating Report, June 2, 2022.

Appendix A — Environmental, Social, and Governance (ESG) Considerations

Environmental, Social, and Governance (ESG) Checklist

ESG Factor	ESG Credit Consideration Applicable to the Credit Analysis: Y/N	Extent of the Effect on the ESG Factor on the Credit Analysis: Relevant (R) or Significant (S)*		
Environmental		Overall:	N	N
Emissions, Effluents, and Waste	Do we consider the costs or risks result, or could result in changes to an issuer's financial, operational, and/or reputational standing?	N	N	N
Carbon and GHG Costs	Does the issuer face increased regulatory pressure relating to the carbon impact of its or its clients' operations resulting in additional costs?	N	N	N
Resource and Energy Management	Does the scarcity of sourcing key resources hinder the production or operations of the issuer, resulting in lower productivity and therefore revenues?	N	N	N
Land Impact and Biodiversity	Is there a financial risk to the issuer for failing to effectively manage land conversion, rehabilitation, land impact, or biodiversity activities?	N	N	N
Climate and Weather Risks	Will climate change and adverse weather events potentially disrupt issuer or client operations, causing a negative financial impact?	N	N	N
Social		Overall:	N	N
Social Impact of Products and Services	Do we consider that the social impact of the issuer's products and services could pose a financial or regulatory risk to the issuer?	N	N	N
Human Capital and Human Rights	Is the issuer exposed to staffing risks, such as the scarcity of skilled labour, uncompetitive wages, or frequent labour relations conflicts that could result in a material financial or operational impact?	N	N	N
	Do violations of rights create a potential liability that can negatively affect the issue's financial wellbeing or reputation?	N	N	N
	Human Capital and Human Rights	N	N	N
Product Governance	Does failure in delivering quality products and services cause damage to customers and expose the issuer to financial and legal liability?	N	N	N
Data Privacy and Security	Has misuse or negligence in maintaining private client or stakeholder data resulted, or could result, in financial penalties or client attrition to the issuer?	N	N	N
Occupational Health and Safety	Would the failure to address workplace hazards have a negative financial impact on the issuer?	N	N	N
Community Relations	Does engagement, or lack of engagement, with local communities pose a financial or reputational risk to the issuer?	N	N	N
Access to Basic Services	Does a failure to provide or protect with respect to essential products or services have the potential to result in any significant negative financial impact on the issuer?	N	N	N
Governance		Overall:	N	N
Bribery, Corruption, and Political Risks	Do alleged or actual illicit payments pose a financial or reputational risk to the issuer?	N	N	N
	Are there any political risks that could impact the issuer's financial position or its reputation?	N	N	N
	Bribery, Corruption, and Political Risks	N	N	N
Business Ethics	Do general professional ethics pose a financial or reputational risk to the issuer?	N	N	N
Corporate / Transaction Governance	Does the issuer's corporate structure limit appropriate board and audit independence?	N	N	N
	Have there been significant governance failures that could negatively affect the issuer's financial wellbeing or reputation?	N	N	N
	Corporate / Transaction Governance	N	N	N
Institutional Strength, Governance, and Transparency (Governments Only)	Compared with other governments, do institutional arrangements provide a higher or lesser degree of accountability, transparency, and effectiveness?	N	N	N
	Are regulatory and oversight bodies insufficiently protected from inappropriate political influence?	N	N	N
	Are government officials insufficiently exposed to public scrutiny or held to insufficiently high ethical standards of conduct?	N	N	N
	Institutional Strength, Governance, and Transparency (Governments Only)	N	N	N
Consolidated ESG Criteria Output:		N	N	N

* A Relevant Effect means that the impact of the applicable ESG risk factor has not changed the rating or rating trend on the issuer.
 A Significant Effect means that the impact of the applicable ESG risk factor has changed the rating or trend on the issuer.

ESG Considerations

Environmental

There were no environmental factors that had a relevant or significant effect on the credit analysis. For more details about which environmental factors could have an effect on the credit analysis, please refer to the checklist above.

Social

There were no social factors that had a relevant or significant effect on the credit analysis. For more details about which social factors could have an effect on the credit, please refer to the checklist above.

Governance

There were no governance factors that had a relevant or significant effect on the credit analysis. For more details about which governance factors could have an effect on the credit analysis, please refer to the checklist above.

The above ESG discussion relates to credit risk factors that could impact the issuer's credit profile and, therefore, the ratings on the Issuer, Long-Term Notes and CP. They are separate from ESG sustainability factors, which are generally outside the scope of this analysis. A description of how DBRS Morningstar considers ESG factors within the DBRS Morningstar analytical framework can be found in *the DBRS Morningstar Criteria: Approach to Environmental, Social, and Governance Risk Factors in Credit Ratings* at <https://www.dbrsmorningstar.com/research/396929/dbrs-morningstar-criteria-approach-to-environmental-social-and-governance-risk-factors-in-credit-ratings>.

Notes:

All figures are in Canadian dollars unless otherwise noted.

For the definition of Issuer Rating, please refer to Rating Definitions under Rating Policy on www.dbrsmorningstar.com.

Generally, Issuer Ratings apply to all senior unsecured obligations of an applicable issuer, except when an issuer has a significant or unique level of secured debt.

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