2019 FUNDED STATUS REPORT

FINANCIAL STATEMENTS

Management's Responsibility for Financial Reporting

Management of the OPSEU Pension Plan Trust Fund (OPTrust) is responsible for the integrity and fairness of the data presented in the financial statements and the financial information presented in the *Funded Status Report* (FSR). The financial statements have been prepared in accordance with the Canadian *Chartered Professional Accountants of Canada Handbook* section 4600 — Pension Plans (s4600) and comply with the financial reporting requirements of the *Pension Benefits Act* (Ontario). In the selection of accounting policies that do not relate to its investment portfolio or pension obligations, OPTrust has chosen to comply on a consistent basis with International Financial Reporting Standards to the extent that those standards do not conflict with the requirements of s4600. The financial statements include amounts that must, as necessary, be based on the best estimates and judgment of management with appropriate consideration as to materiality. Where applicable, the financial information presented throughout the FSR is consistent with the financial statements.

Management has recognized the importance of OPTrust maintaining and reinforcing a high standard of conduct in all of its actions, including the preparation and publication of statements fairly presenting the financial position of the OPSEU Pension Plan (the Plan). Systems of internal control and supporting procedures are maintained to provide assurance that transactions are properly authorized, assets are safeguarded against unauthorized use or disposition and proper records are maintained. The systems are augmented by the careful selection and training of qualified staff, the establishment of organizational structures providing for a well-defined division of responsibilities, and the communication of policies and guidelines of business conduct throughout OPTrust.

The Board of Trustees has the ultimate responsibility for the financial statements presented to plan members. The Audit, Finance and Risk Committee, consisting of Trustees appointed by each of the Province of Ontario and OPSEU, reviews the financial statements with management and the external auditor before such statements are recommended to the Board of Trustees for approval. The Audit, Finance and Risk Committee meets on a regular basis with management and the external auditor to review the scope of the audit, discuss auditor's findings, and satisfies itself that the Board of Trustees' responsibilities have been adequately discharged.

PricewaterhouseCoopers LLP, the Plan's external auditor, has conducted an independent examination of the financial statements in accordance with Canadian generally accepted auditing standards and have expressed their opinion upon completion of such examination in their report to the Board of Trustees. The auditors have full and unrestricted access to management, the Audit, Finance and Risk Committee and the Board of Trustees to discuss their audit and related findings as to the integrity of the Plan's financial reporting and the adequacy of the systems of internal control.

T Hatanaka-Lejnieks

Tracy Hatanaka-Lejnieks
Interim Chief Financial Officer

Peter Lindley
President and Chief Executive Officer

March 5, 2020

Actuaries' Opinion

Towers Watson Canada Inc. (Willis Towers Watson) was retained by the Board of Trustees of the Ontario Public Service Employees' Union Pension Plan (the Plan) to perform an actuarial valuation of the Plan as at December 31, 2019. The purpose of this valuation is to determine the pension obligations of the Plan as at December 31, 2019, for inclusion in the Plan's financial statements in accordance with Section 4600 of the *Chartered Professional Accountants of Canada (CPA Canada) Handbook*.

We have undertaken such a valuation and provided our related report. As this valuation was undertaken for purposes of the Plan's financial statements under the *CPA Canada Handbook* Section 4600, it might not be appropriate for other purposes and should not be relied upon or used for any other purpose.

The results of the valuation disclosed total going concern pension obligations of $20,220 million in respect of service accrued to December 31, 2019.

The valuation of the Plan's going concern pension obligations was based on:

- members' demographic data provided by OPTrust management as at September 27, 2019 projected to December 31, 2019, using management's estimates of experience for the intervening period;
- the actuarial cost method prescribed by the *CPA Canada Handbook* Section 4600; and
- best-estimate assumptions about future events (for example, economic factors such as future rates of inflation and returns on the pension fund, as well as demographic factors) which were developed by OPTrust management in consultation with Willis Towers Watson and have been adopted by OPTrust management and approved by the Board.

Changes have been made to the actuarial assumptions affecting the pension obligations since the previous valuation for the purpose of the Plan's financial statements at December 31, 2019, as described in the notes to the financial statements.

We have reviewed the data used for the valuation and have performed tests of reasonableness and consistency.

In our opinion, for the purposes of the valuation,

- the membership data are sufficient and reliable;
- the assumptions adopted are appropriate;
- the methods employed in the valuation are appropriate; and
- the valuation has been completed in accordance with our understanding of the requirements of the *Chartered Professional Accountants of Canada (CPA Canada) Handbook* Section 4600.

Nonetheless, differences between future experience and the assumptions about such future events will result in gains or losses which will be revealed in future valuations, none of which have been anticipated at this time.

Our valuation was prepared and our opinions given in accordance with accepted actuarial practice in Canada.

Towers Watson Canada Inc.

Philip A. Morse
Fellow, Canadian Institute of Actuaries

Laura Newman
Fellow, Canadian Institute of Actuaries

Toronto, Ontario
March 5, 2020

Independent Auditor's Report

To the Board of Trustees of OPSEU Pension Plan Trust Fund

Our opinion

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of OPSEU Pension Plan Trust Fund (OPTrust) as at December 31, 2019 and 2018, and the changes in its net assets available for benefits and changes in its pension obligations for the years then ended in accordance with Canadian accounting standards for pension plans.

What we have audited

OPTrust's financial statements comprise:

- the statements of financial position as at December 31, 2019 and 2018;
- the statements of changes in net assets available for benefits for the years then ended;
- the statements of changes in pension obligations for the years then ended; and
- the notes to the financial statements, which include a summary of significant accounting policies.

Basis for opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the *Auditor's responsibilities for the audit of the financial statements* section of our report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Independence

We are independent of OPTrust in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada. We have fulfilled our other ethical responsibilities in accordance with these requirements.

Other information

Management is responsible for the other information. The other information comprises the information, other than the financial statements and our auditor's report thereon, included in the *Funded Status Report*.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated.

If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of management and those charged with governance for the financial statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with Canadian accounting standards for pension plans, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing OPTrust's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate OPTrust or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing OPTrust's financial reporting process.

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of OPTrust's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on OPTrust's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause OPTrust to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

PricewaterhouseCoopers LLP

Chartered Professional Accountants, Licensed Public Accountants

Toronto, Ontario
March 5, 2020

Statements of Financial Position

As at December 31 ($ millions)	2019	2018
ASSETS		
Investments (Note 3)	**28,218**	25,860
Contributions receivable (Note 7)	**49**	52
Other assets	**8**	11
	28,275	25,923
LIABILITIES		
Accounts payable and accrued charges	**28**	39
Investment-related liabilities (Note 3)	**6,557**	5,947
	6,585	5,986
NET ASSETS AVAILABLE FOR BENEFITS	**21,690**	19,937
PENSION OBLIGATIONS (Note 5)	**20,220**	18,453
SURPLUS (Note 6)	**1,470**	1,484
PENSION OBLIGATIONS AND SURPLUS	**21,690**	19,937

For the years ended December 31 ($ millions)	2019	2018
SURPLUS, BEGINNING OF YEAR	**1,484**	2,025
CHANGE IN SURPLUS		
Increase/(decrease) in net assets available for benefits	**1,753**	(353)
Increase in net pension obligations	**(1,767)**	(188)
NET DECREASE IN SURPLUS	**(14)**	(541)
SURPLUS, END OF YEAR	**1,470**	1,484

The accompanying notes are an integral part of these financial statements.

The financial statements were authorized for issue by the Board of Trustees on March 5, 2020 and were signed on its behalf by:

Michael Grimaldi
Chair

Sharon Pel
Vice-Chair

Statements of Changes in Net Assets Available for Benefits

For the years ended December 31 ($ millions)	2019	2018
NET ASSETS AVAILABLE FOR BENEFITS, BEGINNING OF YEAR	**19,937**	20,290
Changes Due to Investment Activities		
Investment income (Note 4)	**449**	501
Net gain/(loss) on investments (Note 4)	**1,830**	(291)
Investment management and administrative expenses (Notes 4 and 9)	**(62)**	(65)
	2,217	145
Changes Due to Pension Activities		
Contributions (Note 7)	**552**	539
Benefits paid (Note 8)	**(984)**	(1,013)
Pension administrative expenses (Note 9)	**(32)**	(24)
	(464)	(498)
INCREASE/(DECREASE) IN NET ASSETS AVAILABLE FOR BENEFITS	**1,753**	(353)
NET ASSETS AVAILABLE FOR BENEFITS, END OF YEAR	**21,690**	19,937

The accompanying notes are an integral part of these financial statements.

Statements of Changes in Pension Obligations

For the years ended December 31 ($ millions)	2019	2018
PENSION OBLIGATIONS, BEGINNING OF YEAR	**18,453**	18,265
INCREASE IN PENSION OBLIGATIONS		
Interest accrued on benefits	**1,029**	1,008
Benefits accrued	**498**	492
Assumption changes increase/(decrease) (Note 5)	**1,195**	(106)
	2,722	1,394
DECREASE IN PENSION OBLIGATIONS		
Benefits paid (Note 8)	**984**	1,013
Experience (losses)/gains (Note 5)	**(29)**	193
	955	1,206
INCREASE IN NET PENSION OBLIGATIONS	**1,767**	188
PENSION OBLIGATIONS, END OF YEAR	**20,220**	18,453

The accompanying notes are an integral part of these financial statements.

Notes to the Financial Statements

1. Description of the OPSEU Pension Plan

The OPSEU Pension Plan (the Plan) is a jointly sponsored pension plan. The April 18, 1994 *Sponsorship Agreement* between the Province of Ontario (the Province or Government of Ontario) and Ontario Public Service Employees Union (OPSEU) documented the agreement between the Province and OPSEU (the Sponsors) to establish the Plan, with the Province and OPSEU as joint sponsors. The *Ontario Public Service Employees Union Pension Plan Act*, 1994 enacted in June 1994 facilitated certain aspects of the agreement. The Plan's primary schedule provides pension benefits for employees of the Province in bargaining units represented by OPSEU and certain other bargaining units and employers. Pursuant to a letter of agreement executed by the Sponsors on April 19, 2018, a second schedule known as OPTrust Select was added to the Plan. OPTrust Select members are employees of participating employers in the broader public and nonprofit sectors.

The Plan and the related pension fund (Trust Fund) were established pursuant to the October 25, 1994 *Agreement and Declaration of Trust* (the Trust Agreement). The Trust Agreement also established the Board of Trustees (the Board) as the legal administrator of the Plan and the Trust Fund. The Board is composed of five appointees of the Province and five appointees of OPSEU. The legal name of the Board of Trustees and its employees is the OPSEU Pension Plan Trust Fund. The Plan, Trust Fund and Board are collectively referred to in these financial statements as OPTrust.

The Plan is registered under the *Pension Benefits Act* (Ontario) and the *Income Tax Act* (Canada) under registration number 1012046. The Plan is a registered pension plan as defined in the *Income Tax Act* and is not subject to income tax in Canada. However, OPTrust, its entities and investments are subject to other federal, provincial and municipal taxes in Canada, and may be subject to tax in other countries.

These financial statements reflect OPTrust's financial position, including the net assets available for benefits, pension obligations and surplus.

The following is a summary description of the Plan. For more complete information, reference should be made to the Plan text.

A. FUNDING

Contributions and investment earnings fund plan benefits. The determination of the value of the benefits and required contributions is based on actuarial valuations for funding purposes.

B. CONTRIBUTIONS

Under the primary schedule, the contribution rate for both employers and members since January 1, 2012 is 9.4% of pensionable salary up to the Year's Maximum Pensionable Earnings (YMPE) and 11% of pensionable salary above the YMPE.

Under OPTrust Select, the contribution rate for both employers and members is 3.0% of pensionable salary. For the first two years of participation, new employers are required to contribute an additional 0.2%.

C. PENSION BENEFITS

Pension benefits vest immediately under both schedules and include a lifetime pension payable at age 65.

Under the primary schedule, pensions are determined using a formula that considers a member's total pension service and annual salary rate averaged over the best five sequential years of membership. Members can retire early with an unreduced pension if their age plus years of pension service total 90 or if they are at least 60 years of age and have at least 20 years of pension service. Members who do not qualify for an early unreduced pension may start receiving a reduced pension between ages 55 and 65. Members who retire early also receive a temporary bridge benefit until age 65 or death, whichever occurs first.

Under OPTrust Select, there is no bridge benefit or early unreduced retirement provision. Members are entitled to an unreduced pension at age 65 and may start receiving a reduced pension between ages 55 and 65. The lifetime pension is determined by using a formula that considers a percentage of a member's pensionable pay in each year of membership plus any benefit upgrades granted by the Board.

D. INFLATION PROTECTION

Under the primary schedule, pensions and deferred pensions are adjusted annually for inflation based on changes to the Consumer Price Index, to a maximum of 8% in any one year. Where the inflation adjustment exceeds 8% in any one year, the excess is carried forward to any subsequent years when the adjustment is less than 8%.

Under OPTrust Select, pensions paid to retirees and pension benefits accrued for prior years by active members may be adjusted for inflation at the discretion of the Board.

E. DEATH BENEFITS

A 60% survivor pension is provided to an eligible spouse (or eligible children if there is no spouse) at no cost to pensioners under the primary schedule. Under

OPTrust Select, the member's pension is reduced to pay for a spousal survivor pension. A pre-retirement death benefit is provided to the eligible spouse or to the member's designated beneficiary or estate under both schedules.

F. DISABILITY PENSIONS

Under the primary schedule, a disability pension is available to members with a minimum of 10 years of pension service in the Plan who meet the established criteria. The amount of the disability pension depends on the years of pension service and the average salary of the disabled member. Disability pensions are not available under OPTrust Select.

G. DEFERRED PENSIONS

Members in the primary schedule and OPTrust Select who terminate membership in the Plan before retirement have the right to leave their entitlement in the Plan and receive a pension when they retire. Deferred pensions are increased annually for inflation under the primary schedule only.

H. TERMINATION PAYMENTS

Members who terminate membership in the primary schedule or OPTrust Select before they become eligible for early retirement are entitled to transfer the commuted value of their pension to a registered retirement vehicle, subject to limits under the *Income Tax Act*. In some cases, members may also receive a refund of contributions.

I. TRANSFERS

Under the primary schedule, members who transfer to management positions or certain professional groups are subject to a mandatory transfer of service to the Public Service Pension Plan, administered by the Ontario Pension Board. In addition, a member of the primary schedule who terminates their membership may be entitled to transfer the value of their pension to another pension plan if they are under the age of 55 and the other plan agrees to accept the transfer or if they are under the age of 65 and OPTrust has a reciprocal transfer agreement with that plan.

2. Significant Accounting Policies

A. BASIS OF PRESENTATION

These financial statements are prepared in accordance with the *Chartered Professional Accountants of Canada Handbook* Section 4600 – Pension Plans (s4600). The recognition and measurement of OPTrust's assets and liabilities are consistent with the requirements of s4600. The financial statements also include disclosures required by Regulation 909 of the *Pension Benefits Act*.

In the selection of accounting policies that do not relate to its investment portfolio or pension obligations, OPTrust has chosen to comply on a consistent basis with *International Financial Reporting Standards* (IFRS) to the extent that those standards do not conflict with the requirements of s4600.

These financial statements present the financial position of OPTrust as a separate financial reporting entity independent of participating employers, bargaining units, plan members, pensioners and sponsors.

B. USE OF ESTIMATES

In preparing these financial statements, management must make certain estimates, judgments and assumptions that primarily affect the reported values of assets and liabilities, income and expenses, and related disclosures. Actual amounts could differ from these estimates. Significant estimates and judgments included in the financial statements relate to the valuation of real estate investments, private equity and infrastructure investments, certain fund investments and the determination of the pension obligations.

C. INVESTMENTS

Investments, investment-related assets and investment-related liabilities are financial instruments, and are recognized on a trade date basis and stated at fair value. OPTrust uses *IFRS 13 Fair Value Measurement* in determining fair value.

i) Valuation of Investments

The fair value of investments is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The determination of fair value is based on market conditions at a specific point in time and may not be reflective of future values. Fair values determined using valuation models and techniques require the use of assumptions that may not be supported by observable market transactions or available market data. In such cases, fair values may be significantly impacted by the choice of assumptions.

Fair values are determined as follows:

Cash
Cost approximates fair value.

Short-term Investments
Fair value is determined using cost plus accrued interest or quoted closing mid-market prices. Short-term investments include commercial paper and bank deposits.

Government, Corporate and Real Return Bonds
Fair value is determined using market quotes between the closing bid and ask prices. Where quoted prices are not available, estimated values are calculated using discounted cash flows based on current market yields for comparable securities or market information.

Pooled and Hedge Funds
Fair value is determined through reference to the net asset values as reported by the external fund manager.

Public Equity
Fair value is generally represented by the closing quoted market price. Where a listed market price is not available, fair value is determined using comparable market information.

Real Estate
All direct real estate investments are valued using appropriate valuation methodologies on an annual basis. Independent appraisals are conducted at least once every three years. Where an investment is not independently valued, it is valued internally.

Investments held through fund investments are determined using the values reported by the external fund managers and updated for any specific market and other investment factors known to OPTrust that could affect the fair value of the investment.

Mortgages held on real estate investments are valued using discounted cash flows based on indicative market yields of securities with comparable credit risk and term to maturity.

Private Equity and Infrastructure
Private equity and infrastructure investments are valued on an annual basis, except where market prices are available. Fair value is determined using appropriate valuation methodologies and management's best estimates. All significant investments are externally valued on an annual basis. Where an investment is not independently valued, it is valued internally.

For investments held through fund investments, fair value is generally determined by the external investment manager using accepted valuation methods and other relevant information. Valuations are updated for any specific market and other investment factors known to OPTrust that could affect the fair value of the investment.

Derivative Instruments
Derivative instruments are financial contracts, the value of which is derived from changes in underlying assets, interest rates, foreign exchange rates, commodities or indices. Market prices are used for exchange-traded derivatives. Where quoted prices are not available, derivatives are valued using appropriate valuation techniques such as option pricing models, discounted cash flows and consensus pricing from independent brokers and/or third-party vendors. Inputs used in these valuations include, but are not limited to, spot prices, price volatilities, currency exchange rates, interest rate curves and credit spreads, in determining fair value.

Resell and Repurchase Agreements
Resell agreements (reverse repos) and repurchase agreements (repos) are transactions where OPTrust buys and sells securities and simultaneously agrees to sell and buy them back at a specified price at a future date. Resell and repurchase agreements are carried at cost, which together with accrued interest approximates fair value due to their short-term nature.

Collateral
Cash collateral provided by OPTrust is excluded from cash on these financial statements and an equivalent receivable amount is recognized as cash collateral pledged. Cash collateral received by OPTrust from counterparties is recognized as cash and a liability for the equivalent amount is recognized as cash collateral received.

OPTrust does not sell, repledge or otherwise use any collateral held in the form of securities. For collateral pledged in the form of securities, the asset remains as an investment in OPTrust's financial statements. For collateral received in the form of securities, the asset is not recognized in OPTrust's financial statements as the risks and rewards of ownership have not been transferred.

ii) Income Recognition
Net investment income includes interest and dividend income from investments, realized gains and losses on disposal of investments, and unrealized gains and losses resulting from changes in the fair value of investments. Investment income is recognized on an accrual basis.

Realized gains and losses arise from the sale of the investment and represent the difference between net proceeds on disposal and cost. Unrealized gains and losses represent the change in the difference between the estimated fair value and cost of the investment held.

iii) Transaction Fees
Transaction fees include incremental costs directly attributable to the acquisition or issue of investment assets or liabilities, and are expensed in the period on an accrual basis.

iv) External Management and Performance Fees
External management fees for portfolio management are expensed when directly incurred by OPTrust in the period and recognized on an accrual basis. Performance fees are paid to external managers when investment returns exceed a prescribed threshold. These fees and other certain management fees are offset against net investment income.

D. PENSION OBLIGATIONS
The value of pension obligations is determined based on actuarial valuations prepared by an independent actuarial firm and verified by OPTrust. Actuarial valuations are prepared every year for financial statement reporting (financial statement valuations) and at least every three years for purposes of determining funding requirements (funding valuations).

For financial reporting purposes, s4600 requires that pension plans report the actuarial value of pension obligations using management's best estimate assumptions and the projected unit credit method, prorated on service. This method calculates the actuarial value of pension benefits accrued up to the financial reporting date, after the projected benefits have been attributed equally to each year of a member's service. This method differs from the modified aggregate method, chosen by OPTrust and used for funding purposes, which includes the members' and employers' expected future contributions, pension benefits to be earned after the reporting date and margins of conservatism in the setting of economic assumptions. The projected benefits for OPTrust Select include the value of future intended benefit enhancements that are currently targeted at full inflation protection.

E. CONTRIBUTIONS

Contributions from members and employers that are due at year-end and transfers into the Plan, are recorded on an accrual basis. The carrying value of the receivable approximates fair value due to its short-term nature.

F. BENEFIT PAYMENTS

Payments of pensions, refunds and transfers are recorded on an accrual basis.

G. SURPLUS/DEFICIT

Surplus or deficit results from the excess or shortfall of the value of net assets available for benefits over the actuarial value of pension obligations.

H. FOREIGN CURRENCY TRANSLATION

Foreign currency transactions are translated into Canadian dollars at the rates of exchange prevailing at the dates of the transactions. The fair value of investments and cash balances denominated in foreign currencies is translated at the rates in effect at year-end. The resulting unrealized gain or loss is included in the statement of changes in net assets available for benefits.

I. FAIR VALUE DISCLOSURES

All financial instruments measured at fair value are categorized into one of three hierarchy levels, described below, for disclosure purposes. Each level is based on the transparency of the inputs used to measure the fair values of assets and liabilities:

Level 1 — inputs are unadjusted quoted prices of identical assets or liabilities in active markets. Investments that are classified as Level 1 generally include cash, actively traded equity securities and exchange traded derivatives which are valued using quoted prices.

Level 2 — inputs other than quoted prices, that are observable for the asset or liability, either directly or indirectly. Investments that are classified as Level 2 include short-term securities, resell agreements, repurchase agreements, government, real return and corporate bonds and over-the-counter (OTC) derivatives. For these investments, fair values are either derived from quoted prices from less actively traded markets, independent price sources, or pricing models that use observable market data.

Level 3 — one or more significant inputs used in valuation methodologies that are unobservable in determining fair values of the assets or liabilities. Investments that are classified as Level 3 include investments in most private equity, infrastructure, real estate, pooled and hedge fund investments.

Determination of fair value and the resulting hierarchy requires the use of observable market data whenever available. The classification of a financial instrument in the hierarchy is based upon the lowest level of input that is significant to the measurement of fair value.

J. RECLASSIFICATION

Certain comparative figures have been reclassified to conform with current year presentation.

3. Investments

A. FAIR VALUE HIERARCHY

The following schedule presents the fair value of OPTrust's investments categorized within the fair value hierarchy as described in Note 2.

	2019					2018				
As at December 31 ($ millions)	**Level 1**	**Level 2**	**Level 3**	**Fair value**	**Cost**	Level 1	Level 2	Level 3	Fair value	Cost
Fixed income										
Cash	**351**	**—**	**—**	**351**	**351**	351	—	—	351	351
Short-term investments	**—**	**2,374**	**—**	**2,374**	**2,367**	—	3,055	—	3,055	3,046
Government and corporate bonds										
Canadian	**—**	**8,071**	**—**	**8,071**	**7,855**	—	5,851	—	5,851	5,890
Foreign	**—**	**700**	**—**	**700**	**715**	—	434	—	434	404
Real return bonds										
Canadian	**—**	**441**	**—**	**441**	**302**	—	421	—	421	302
Foreign	**—**	**618**	**—**	**618**	**624**	—	445	—	445	436
	351	**12,204**	**—**	**12,555**	**12,214**	351	10,206	—	10,557	10,429
Public equity										
Canadian	**33**	**—**	**—**	**33**	**36**	29	—	—	29	34
Foreign	**1,666**	**—**	**—**	**1,666**	**1,307**	1,396	—	—	1,396	1,226
	1,699	**—**	**—**	**1,699**	**1,343**	1,425	—	—	1,425	1,260
Pooled and hedge funds	**—**	**222**	**4,644**	**4,866**	**4,716**	13	222	5,628	5,863	5,790
Real estate	**16**	**—**	**3,075**	**3,091**	**2,524**	—	—	2,927	2,927	2,279
Private equity	**—**	**—**	**2,797**	**2,797**	**2,137**	—	—	2,288	2,288	1,647
Infrastructure	**—**	**—**	**2,405**	**2,405**	**1,756**	137	—	2,339	2,476	1,888
	16	**222**	**12,921**	**13,159**	**11,133**	150	222	13,182	13,554	11,604
Investment-related assets										
Cash collateral pledged	**58**	**—**	**—**	**58**	**58**	165	—	—	165	163
Accrued income	**5**	**39**	**—**	**44**	**44**	4	33	—	37	37
Derivative instruments	**—**	**217**	**—**	**217**	**75**	—	122	—	122	15
Resell agreements	**—**	**486**	**—**	**486**	**490**	—	—	—	—	—
	63	**742**	**—**	**805**	**667**	169	155	—	324	215
INVESTMENT ASSETS	**2,129**	**13,168**	**12,921**	**28,218**	**25,357**	2,095	10,583	13,182	25,860	23,508
Investment-related liabilities										
Cash collateral received	**(124)**	**—**	**—**	**(124)**	**(124)**	(44)	—	—	(44)	(44)
Due to brokers and other liabilities	**(67)**	**—**	**—**	**(67)**	**(67)**	(60)	—	—	(60)	(60)
Derivative instruments	**—**	**(63)**	**—**	**(63)**	**(9)**	—	(287)	—	(287)	(2)
Repurchase agreements	**—**	**(6,303)**	**—**	**(6,303)**	**(6,337)**	—	(5,556)	—	(5,556)	(5,541)
	(191)	**(6,366)**	**—**	**(6,557)**	**(6,537)**	(104)	(5,843)	—	(5,947)	(5,647)
NET INVESTMENTS	**1,938**	**6,802**	**12,921**	**21,661**	**18,820**	1,991	4,740	13,182	19,913	17,861

B. CHANGES IN FAIR VALUE MEASUREMENT FOR INVESTMENTS IN LEVEL 3

The following table presents a reconciliation of financial instruments included in Level 3 of the fair value hierarchy:

	2019					2018				
For the years ended December 31 ($ millions)	**Pooled and hedge funds**	**Real estate**	**Private equity**	**Infra-structure**	**Total**	Pooled and hedge funds	Real estate	Private equity	Infra-structure	Total
Balance, beginning of year	**5,628**	**2,927**	**2,288**	**2,339**	**13,182**	4,322	2,823	1,920	2,025	11,090
Net realized gains	**57**	**194**	**446**	**57**	**754**	48	140	341	127	656
Change in unrealized gains/(losses)	**77**	**(88)**	**10**	**99**	**98**	(199)	122	58	148	129
Purchases	**631**	**631**	**662**	**90**	**2,014**	1,945	343	207	188	2,683
Sales/Redemptions	**(1,749)**	**(589)**	**(609)**	**(180)**	**(3,127)**	(488)	(501)	(238)	(149)	(1,376)
BALANCE, END OF YEAR[a]	**4,644**	**3,075**	**2,797**	**2,405**	**12,921**	5,628	2,927	2,288	2,339	13,182

a There were no transfers in nor out of Level 3 and no settlements of Level 3 financial instruments for the years ended 2019 and 2018.

C. SENSITIVITY TO CHANGES IN ASSUMPTIONS

Sensitivity information is available for direct investments in real estate and certain private equity and infrastructure investments, and is presented in the table below. Due to limitations, such as lack of information rights, sensitivity changes are not provided for certain investments.

		2019			2018	
As at December 31 ($ millions)	**Key factor**	**Change in key factor**	**Fair value**	**Increase/ (Decrease) to fair value**	Fair value	Increase/ (Decrease) to fair value
Real estate	Capitalization rate[a]	+/- 0.25%	2,920	(101)/115	2,523	(108)/119
Mortgages	Interest rate	+/- 0.25%	1,173	(11)/12	876	(7)/7
Infrastructure	Discount rate[b]	+/- 0.25%	2,130	(45)/48	528	(18)/13
Private equity	Discount rate[b]	+/- 0.25%	N/A[c]	N/A[c]	125	(1)/1
Private equity	EBITDA multiple[d]	+/- 10%	670	138/(138)	N/A[c]	N/A[c]

a A rate of return to derive the value of an investment property based on expected income.

b The rate used in discounted cash flow analysis to determine the present value of future cash flows.

c OPTrust values the majority of its private equity investments using the EBITDA multiple and has been doing so for a number of years. On that basis, a sensitivity of the discount rate will no longer be disclosed starting in 2019, as it is deemed not to be a significant input to value the private equity portfolio by management.

d EBITDA is defined as earnings before interest, taxes, depreciation and amortization. The EBITDA multiple is used to determine the fair value of a company based on the subject company's EBITDA.

D. DERIVATIVE CONTRACTS

OPTrust utilizes derivatives to manage its asset mix exposure, enhance returns and manage financial risk. Derivative contracts are transacted by OPTrust either directly with counterparties in the OTC market or on regulated exchanges and execution platforms. The following are the types of derivative contracts that OPTrust has entered into:

Futures

Futures are standardized contracts traded on regulated future exchanges and are subject to daily cash settlement of changes in fair value. Futures contracts include the following:

Interest rate futures are contractual obligations to either buy or sell interest rate sensitive financial instruments or indices at a specified price at a future date.

Equity index futures are standardized contracts to either buy or sell a specific equity index at a specified price at a future date.

Commodity futures are standardized contracts to either buy or sell a predetermined amount of a commodity at a specified price at a future date.

Forwards

A forward contract is a contract between two parties to buy or sell an asset at a specified price at a future date. OTC currency forward contracts are contractual agreements between two parties to exchange a notional amount of one currency for another at a specified price for settlement at a future date.

Options

Options are contractual agreements under which the seller (writer) grants the purchaser the right, but not the obligation, either to buy (call option) or sell (put option) a security, currency or another financial instrument at a specified price at or by a future date. They may be acquired in standardized amounts on regulated exchanges or may be customized and acquired in the OTC market.

Swaps

Swaps are OTC contracts between two parties to exchange a series of cash flows. Swaps contracts include the following:

Equity and commodity swaps are contracts between two parties to exchange a series of cash flows based on the return of an equity, a basket of equities or an equity or commodity index. One party typically agrees to pay a floating interest rate in return for receiving the equity or commodity return.

An interest rate swap is a contractual agreement between two parties to exchange a series of fixed for floating cash flows based on a notional amount of principal.

A credit default swap is a contractual agreement between two parties to provide protection against a change in value due to a credit event of referenced debt instruments. The purchaser pays premiums to the seller on the credit default swap in return for payment related to a change in value due to credit events.

The notional amounts of derivative contracts represent the nominal or face amount that is used to calculate the cash payments made on that contract. The fair values of the derivative contracts included in the financial statements are determined by using the notional values and changes in the market rates or prices relative to the original terms of the contract. The notional values do not necessarily reflect the future cash flows to be exchanged nor do they indicate OPTrust's exposure to market or credit risk.

The following schedule presents the notional and fair value of OPTrust's derivative contracts held:

As at December 31 ($ millions)			2019 Notional amount	2019 Fair value assets	2019 Fair value liabilities	2018 Notional amount	2018 Fair value assets	2018 Fair value liabilities
Interest rate contracts	Futures	– long positions	**148**	**—**	**—**	1,595	—	—
		– short positions	**70**	**—**	**—**	1,719	—	—
	Options	– long positions	**10**	**10**	**—**	11	10	—
	Swaps	– long positions	**1,837**	**—**	**(38)**	3,150	—	(50)
		– short positions	**839**	**42**	**(2)**	4,147	40	—
Equity contracts	Futures	– long positions	**797**	**—**	**—**	733	—	—
		– short positions	**—**	**—**	**—**	58	—	—
	Options	– long positions	**—**	**—**	**—**	110	—	—
		– short positions	**—**	**—**	**—**	53	—	(1)
Commodity contracts	Futures	– long positions	**548**	**—**	**—**	423	—	—
		– short positions	**12**	**—**	**—**	1	—	—
Currency contracts	Forwards		**7,145**	**77**	**(23)**	8,075	70	(236)
	Options	– long positions	**—**	**—**	**—**	230	2	—
Credit contracts	Credit default swaps							
		– long positions	**438**	**—**	**(11)**	—	—	—
		– short positions	**1,040**	**99**	**—**	—	—	—
TOTAL DERIVATIVES				**228**	**(74)**		122	(287)

The following schedule presents the net fair values for OPTrust's derivative positions by term to maturity:

As at December 31 ($ millions)	2019 Within 1 year	2019 1 to 5 years	2019 5 to 10 years	2019 Over 10 years	2019 Total	2018 Within 1 year	2018 1 to 5 years	2018 5 to 10 years	2018 Over 10 years	2018 Total
Interest rate contracts	**1**	**(6)**	**(12)**	**29**	**12**	4	29	(15)	(18)	—
Equity contracts	**—**	**—**	**—**	**—**	**—**	(1)	—	—	—	(1)
Currency contracts	**54**	**—**	**—**	**—**	**54**	(164)	—	—	—	(164)
Credit contracts	**—**	**88**	**—**	**—**	**88**	—	—	—	—	—
TOTAL	**55**	**82**	**(12)**	**29**	**154**	(161)	29	(15)	(18)	(165)

E. SIGNIFICANT INVESTMENTS

The following schedule presents OPTrust investments having a fair value or cost exceeding 1% of the fair value or cost of net investment assets as at December 31.

	2019			2018		
As at December 31 ($ millions)	**Number of investments**	**Fair value**	**Cost**	Number of investments	Fair value	Cost
Fixed income	**17**	**5,402**	**5,176**	21	5,443	5,350
Pooled and hedge funds	**6**	**3,695**	**3,581**	6	5,122	5,131
Infrastructure	**3**	**1,425**	**937**	3	1,364	935

As at December 31, 2019, the investments where the individual issue has a cost or fair value exceeding 1% of the cost or fair value of net investment assets were comprised of one or more holdings of the following:

Fixed income — Government of Canada, Province of Ontario, Province of Quebec, Safe Trust, Sound Trust, Sure Trust and Merit Trust.

Pooled and hedge funds — AQR Offshore Multi-Strategy Fund XVIII LP, Aviva Investors Multi-Strategy Target Return Private Pooled Fund, Bridgewater Pure Alpha Major Markets, Ltd, Man Risk Premia Bespoke X LP, PIMCO Multi-Strategy Credit Fund and Schroders OPTrust Diversified Growth Fund.

Infrastructure — Globalvia Infraestructuras, S.A., Firelight Infrastructure Partners LP and Harvest Pipeline Company.

F. RISK MANAGEMENT

Investment Risk

OPTrust is subject to certain investment risks and engages in risk management practices to help ensure that sufficient assets will be available to fund pension benefits.

The management of these investment risks is addressed in OPTrust's Risk Appetite Statement and other management policies.

Investment risk includes the following types of risk:

Market Risk

Market risk is the risk that the value of an investment will be adversely affected by changes in interest rates, foreign exchange rates, inflation rates, equity and commodity prices. OPTrust manages market risk through investment management practices designed to optimize the relationship between risk and return and the diversification of investments across a variety of asset classes. Risk mitigation strategies aimed at lowering the total fund's risk level are actively employed.

(a) Interest Rate Risk

Interest rate risk is the risk that the fair value of future cash flows of a financial instrument will fluctuate because of changes in market interest rates. The potential exposure results from either changes in floating interest rates which increase or decrease cash flows or changes in the asset values for fixed rate securities (e.g. bonds, mortgages and bank loans). During periods of rising interest rates, the market value of the existing fixed income securities will generally decrease.

OPTrust manages interest rate risk relative to its liabilities by investing so that there is an appropriate mix between interest-sensitive investments and those subject to other risks. There are also certain real estate, private equity and infrastructure investments which may have interest rate components making them subject to interest rate exposure.

A 1% increase or decrease in interest rates, with all other variables held constant, would result in a decrease or increase in the value of the fixed income portfolio of $1,199 million (2018 – $930 million) respectively.

(b) Foreign Currency Risk

Foreign currency risk is the risk that the value of foreign investments will be affected by changes in foreign currency exchange rates for Canadian dollars. Currency risk is managed at the total OPTrust level. OPTrust hedges most of its currency exposure using currency forwards. The remaining unhedged exposures include currencies that are used to diversify total portfolio risk, emerging market currencies, and opportunistic exposures.

OPTrust's market value exposure to foreign exchange risk is as follows:

As at December 31 ($ millions)	2019 Gross exposure	2019 Impact of derivatives[a]	2019 Net exposure	2018 Net exposure
Canadian Dollar	**13,223**	**4,495**	**17,718**	17,505
Investments subject to currency risk				
United States Dollar	4,783	(2,914)	1,869	452
Japanese Yen	107	432	539	520
Swiss Franc	23	506	529	532
Taiwan Dollar	130	57	187	126
South Korean Won	122	56	178	188
Euro	1,635	(1,705)	(70)	(75)
Europe – other	368	(297)	71	121
Asia Pacific – other	905	(851)	54	18
Emerging Markets – other	365	221	586	526
	8,438	**(4,495)**	**3,943**	2,408
NET INVESTMENTS	**21,661**	**—**	**21,661**	19,913

a The impact of derivatives reflects the foreign currency exposure represented by the notional amount hedged using currency forwards.

The impact of a 5% absolute change in the Canadian dollar against the top five currency exposures held at year-end, holding all other variables constant would have resulted in a $157 million change in net assets available for benefits as at December 31, 2019 (2018 - $86 million).

As at December 31 ($ millions)	Change versus Canadian Dollar	2019 Change in net assets available for benefits	2018 Change in net assets available for benefits
United States Dollar	+/- 5%	+/-89	+/-21
Japanese Yen	+/- 5%	+/-26	+/-25
Swiss Franc	+/- 5%	+/-25	+/-25
Taiwan Dollar	+/- 5%	+/-9	+/-6
South Korean Won	+/- 5%	+/-8	+/-9
TOTAL		**+/-157**	+/-86

(c) Equity Price Risk

Equity price risk is the risk that the fair value of a financial instrument will fluctuate because of changes in equity market prices whether those changes are caused by factors specific to the individual financial instrument, its issuer, or factors affecting all similar financial instruments traded in the market. OPTrust is exposed to equity price risk through its investment in public and private equities.

OPTrust manages equity price risk through adherence to approved policies and guidelines.

The table below shows the impact of a 10% change in the private, developed and emerging equity markets.

As at December 31 ($ millions) Equity market[a]	Market index	Change in market index[b]	2019 Change in net assets available for benefits	2018 Change in net assets available for benefits
Private	**MSCI World Index**	**+/- 10%**	**+/-212**	+/-183
Emerging	**MSCI EMF Index**	**+/- 10%**	**+/-123**	+/-116
Developed	**MSCI World Index**	**+/- 10%**	**+/-91**	+/-73
TOTAL			**+/-426**	+/-372

a Equity market is based on the portfolio mandates of the investment managers.

b For each equity category, the expected effect of a 10% change in the market index is estimated using market data since January 2004. Currency exchange rates are not affected by the change in market indices.

(d) Commodity Price Risk

Commodity price risk is the risk that the fair value of investments will fluctuate due to changes in market prices of commodities.

As at December 31 ($ millions) Commodity market	Market benchmark	Change in market index[a]	2019 Change in net assets available for benefits	2018 Change in net assets available for benefits
Gold	S&P GSCI Gold Total Return Index	**+/- 10%**	**+/-54**	+/-31
Broad Commodity Index[b]	Bloomberg Commodity Index	**+/- 10%**	**—**	+/-10
TOTAL			**+/-54**	+/-41

a The expected effect of a 10% change in the commodity market index is estimated using market data since January 2004. Currency exchange rates are not affected by the change in market indices.

b There was no Broad Commodity Index exposure in 2019.

Credit Risk

Credit risk is the risk of financial loss due to a counterparty, borrower, issuer, endorser or guarantor failing to make payments under its contractual obligations. OPTrust has exposure to credit risk through debt securities, resell agreements and OTC derivatives.

OPTrust mitigates credit risk on debt securities through adherence to approved policies and guidelines, which includes guidelines on exposure to single issuers.

Credit risk from OTC derivatives and resell agreements is managed by requiring counterparties to post collateral in order to back the fair value of these derivative contracts.

Credit risk for investments is measured by the positive fair value of the contractual obligations with the counterparties less any collateral or margin received as at the reporting date. OPTrust also monitors how the positive fair value of OTC derivatives and resell agreements may change in the future to ensure adequate collateral is in place.

The credit risk exposure by credit rating, without taking account of any collateral held is as follows:

	2019					2018				
As at December 31 ($ millions)	**Short-term investments**	**Bonds**	**Resell agreements**	**Derivatives[a]**	**Total**	Short-term investments	Bonds	Resell agreements	Derivatives[a]	Total
AAA/R-1 High	**2,264**	**3,203**	**—**	**—**	**5,467**	2,585	2,743	—	—	5,328
AA/R-1 Mid	**—**	**1,544**	**240**	**3**	**1,787**	—	1,337	—	—	1,337
A/R-1 Low	**110**	**4,242**	**246**	**204**	**4,802**	425	3,071	—	110	3,606
BBB/R-2 Low or lower	**—**	**841**	**—**	**—**	**841**	45	—	—	—	45
TOTAL	**2,374**	**9,830**	**486**	**207**	**12,897**	3,055	7,151	—	110	10,316

a Excludes exchange traded derivatives.

OPTrust's collateral arrangements that support certain investment activities are as follows:

(a) Derivatives

Collateral is received from and pledged to counterparties to manage credit risk from OTC derivatives in accordance with the Credit Support Annex (CSA), which forms part of the International Swaps and Derivatives Association (ISDA) master agreements. It is common practice to execute a CSA in conjunction with an ISDA master agreement. Under the ISDA master agreement for OTC derivatives, OPTrust has a right to offset credit risk against collateral received in the event of default, insolvency, bankruptcy or other early termination. In the case of exchange-traded derivatives, there is no provision to offset against obligations to the same counterparty.

(b) Resell and Repurchase Agreements

Resell and repurchase agreements include collateral received and pledged from and to counterparties.

(c) Securities Lending Program

OPTrust participates in a securities lending agreement whereby it lends securities to approved borrowers. OPTrust secures its exposure through the receipt of security collateral of at least 105% of the value of the securities lent. All securities lent are recallable on demand at the option of OPTrust. Credit risk associated with the borrower is mitigated by requiring the borrower to provide collateral with market values exceeding the market value of the loaned securities. OPTrust continues to recognize securities on loan and does not recognize securities received as collateral.

The fair value of collateral received and pledged for derivatives, resell and repurchase agreements as well as for securities loaned as at December 31, is as follows:

As at December 31 ($ millions)	2019	2018
Derivatives		
Collateral received[a]	**(122)**	(11)
Collateral pledged[b]	**156**	283
Resell and Repurchase Agreements		
Associated receivable from resell agreements	**486**	—
Collateral received[c]	**(485)**	—
Associated liability from repurchase agreements	**(6,303)**	(5,556)
Collateral pledged[c]	**6,320**	5,544
Securities Lending Program		
Securities loaned	**164**	229
Collateral received	**(175)**	(248)

a Includes cash collateral (received) of $(122) million (2018 - $(11) million).

b Includes cash collateral pledged of $2 million (2018 - $165 million).

c Includes net cash collateral pledged/(received) of $54 million (2018 - $(33) million).

(d) Offsetting Arrangements

Financial assets and liabilities are offset and the net amount reported in the statement of financial position where OPTrust currently has a legally enforceable right to set-off the recognized amounts and there is an intention to settle on a net basis or realize the asset and settle the liability simultaneously. In the normal course of business, OPTrust enters into various master netting agreements or other similar arrangements that do not meet the criteria for offsetting in the statement of financial position but still allow for the related amounts to be set-off in certain circumstances, such as bankruptcy or the termination of the contracts.

The following table presents the recognized financial instruments that are offset, or subject to enforceable netting arrangements as at December 31, 2019 and 2018. Similar arrangements include repurchase agreements, resell agreements, securities lending and any related rights to financial collateral.

	2019				
				Related amounts not set-off in the statement of financial position	
As at December 31 ($ millions)	**Gross amounts of recognized financial instruments**	**Gross amounts of recognized financial instruments set-off**	**Net amounts of financial instruments presented**	**Financial collateral (received)/ pledged**	**Net amount**
Financial assets					
Derivative instruments	**234**	**(17)**	**217**	**(122)**	**95**
Resell agreements	**486**	—	**486**	**(485)**	**1**
Securities lending	**164**	—	**164**[a]	**(164)**	—
TOTAL FINANCIAL ASSETS	**884**	**(17)**	**867**	**(771)**	**96**
Financial liabilities					
Derivative instruments	**(80)**	**17**	**(63)**	**63**	—
Repurchase agreements	**(6,303)**	—	**(6,303)**	**6,303**	—
TOTAL FINANCIAL LIABILITIES	**(6,383)**	**17**	**(6,366)**	**6,366**	—

As at December 31 ($ millions)			2018		
Financial assets					
Derivative instruments	126	(4)	122	(11)	111
Resell agreements	—	—	—	—	—
Securities lending	229	—	229[a]	(229)	—
TOTAL FINANCIAL ASSETS	355	(4)	351	(240)	111
Financial liabilities					
Derivative instruments	(291)	4	(287)	283	(4)
Repurchase agreements	(5,556)	—	(5,556)	5,554	(12)
TOTAL FINANCIAL LIABILITIES	(5,847)	4	(5,843)	5,827	(16)

a These securities are included in public equity investments.

Liquidity Risk

Liquidity risk is the potential that OPTrust will not be able to meet payment obligations for pension payments, operating expenses or investment activities as they come due without the forced sale of assets. OPTrust has exposure to liquidity risk through its investment commitments, which are required to be funded in future periods, as well as through holding certain investments including pooled and hedge funds, private equity, infrastructure and real estate investments, which by nature are less liquid than public market assets (see Note 10). An additional source of liquidity risk exposure is OPTrust's use of derivatives with their potential margin calls which are impacted by daily market movements.

OPTrust forecasts and manages cash flows centrally to ensure it meets its obligations when due without unintended early liquidation of assets. OPTrust's cash and liquidity positions are monitored daily for compliance with guidelines and limits established in a liquidity framework. Both short-term and long-term cash and liquidity requirements are assessed within this framework. In addition, OPTrust conducts various stress tests to examine how they may impact liquidity.

Liquidity risk is managed by holding cash and cash equivalents, liquid money market securities and unencumbered high quality liquid securities that can be sold under repurchase agreements to raise funds. A core liquidity reserve is maintained for deployment in the event of severe market disruption.

The remaining terms to contractual maturity of OPTrust's investment-related liabilities are as follows:

	2019			
As at December 31 ($ millions)	**Within 1 year**	**1 to 5 years**	**Over 5 years**	**Total**
Cash collateral received	**(124)**	—	—	**(124)**
Due to brokers and other liabilities	**(44)**	**(23)**	—	**(67)**
Derivative instruments	**(23)**	**(20)**	**(20)**	**(63)**
Repurchase agreements	**(6,303)**	—	—	**(6,303)**
TOTAL	**(6,494)**	**(43)**	**(20)**	**(6,557)**

	2018			
Cash collateral received	(44)	—	—	(44)
Due to brokers and other liabilities	(35)	(25)	—	(60)
Derivative instruments	(237)	(10)	(40)	(287)
Repurchase agreements	(5,556)	—	—	(5,556)
TOTAL	(5,872)	(35)	(40)	(5,947)

OPTrust maintains unsecured credit facilities to meet potential liquidity requirements. As at December 31, 2019 and 2018 certain amounts were drawn on the credit facilities in the form of letters of credit.

4. Net Investment Income

For the years ended December 31 ($ millions)	2019 Investment income/(loss)	2019 Net gain/(loss) on investments[a]	2019 Net investment income[b/c]	2018 Investment income	2018 Net gain/(loss) on investments[a]	2018 Net investment income/(loss)[b/c]
Fixed income						
Cash and short-term investments	68	(4)	64	57	1	58
Government and corporate bonds						
Canadian	124	371	495	110	(92)	18
Foreign	(3)	41	38	8	(80)	(72)
Real return bonds						
Canadian	11	20	31	3	(12)	(9)
Foreign	4	47	51	—	4	4
	204	475	679	178	(179)	(1)
Public equity						
Canadian	1	2	3	1	(5)	(4)
Foreign	42	231	273	44	(49)	(5)
	43	233	276	45	(54)	(9)
Pooled and hedge funds	1	141	142	1	(162)	(161)
Real estate	138	(31)	107	128	134	262
Private equity	26	430	456	38	361	399
Infrastructure	37	118	155	111	195	306
Derivative instruments	—	464	464	—	(586)	(586)
	202	1,122	1,324	278	(58)	220
	449	1,830	2,279	501	(291)	210
Investment management expenses						
External manager fees			(11)			(11)
Transaction fees			(7)			(6)
			(18)			(17)
NET INVESTMENT INCOME			2,261			193

a Includes realized gain of $1,113 million and unrealized gain of $717 million in 2019 and realized gain of $147 million and unrealized loss of $(438) million in 2018.

b Certain investment-related disbursements of $52 million in 2019 (2018 - $58 million) have been netted against net investment income/(loss).

c Net of certain management and performance fees for portfolio management.

5. Pension Obligations

A. FINANCIAL STATEMENT VALUATION

OPTrust annually reviews the actuarial assumptions used in the financial statement valuation to ensure that they reflect management's best estimate of expected trends. The key economic assumptions used for the valuation are as follows:

As at December 31	2019	2018
Inflation rate	**2.00%**	2.00%
Discount rate (real)	**3.20%**	3.65%
Discount rate (nominal)	**5.20%**	5.65%
Salary increases (nominal)	**2.75%**	2.75%

Experience (losses)/gains of $(29) million (2018 - $193 million) on OPTrust's pension obligations are due to differences between actual experience and assumptions. The assumption change (losses)/gains of $(1,195) million (2018 - $106 million) on OPTrust's pension obligations is primarily due to a change in the discount rate assumption noted above.

The financial statement nominal discount rate decreased from 5.65% as at December 31, 2018 to 5.20% as at December 31, 2019 to reflect changes in market conditions and return expectations.

B. FUNDING VALUATION

The funding valuation is based on the modified aggregate method. This method considers a time horizon that includes accumulation of benefits and receipt of contributions in respect of current members in future periods. Generally, the actuarial assumptions used to determine the pension obligations for funding purposes are more conservative than those used for the financial statement valuation. Pension obligations are valued using economic assumptions developed by reference to long-term market conditions. The funding valuation is used to identify gains or losses. Gains or losses are first split between the primary schedule and OPTrust Select based on accrued liability. Gains and losses are shared equally between the Sponsors.

Gains attributed to the primary schedule will be allocated at the discretion of the Sponsors to fund benefit improvements, reduce contributions, or reduce any existing funding deficiencies. Funding deficiencies resulting from losses are funded over a maximum of 15 years from increased contributions.

Gains attributed to OPTrust Select are allocated at the discretion of the Sponsors after all intended benefit enhancements have been provided to members. The Sponsors can fund benefit improvements, reduce contributions, or reduce any existing funding deficiencies. Funding deficiencies resulting from losses primarily reduce the level of benefit enhancements from those intended.

In accordance with the *Pension Benefits Act*, the *Income Tax Act* and regulations, an actuarial valuation for funding purposes is required to be filed at least every three years to assess OPTrust's financial position, and to determine the funding requirements. In 2020, OPTrust is expected to file with the regulator, the December 31, 2019 funding valuation, as prepared by Willis Towers Watson, showing that the Plan is fully funded, and the next funding valuation will not be required to be filed until December 31, 2022.

6. Capital

OPTrust is not under regulatory requirements as it relates to capital. OPTrust defines capital as the funded position of the Plan, whether in surplus or deficit. Surplus is generated during periods of favourable economic performance and drawn down during periods of unfavourable economic performance in order to maintain OPTrust's capacity to pay its pension obligations without unduly affecting contribution levels. The surplus was $1,470 million as of December 31, 2019 (2018 - $1,484 million). The objective of managing capital is to ensure the Plan is fully funded to pay the plan benefits over the long term. A funding valuation is used to manage capital by identifying gains or losses as described in Note 5. OPTrust prudently manages its investments to satisfy its long-term funding requirement in accordance with its *Statement of Investment Policies and Procedures* (SIP&P) and other policies and guidelines. The SIP&P was established in 1995 and was last amended in 2019 to revise the asset mix disclosure and to reflect regulatory changes.

OPTrust uses stress scenarios to monitor the market risks in the Plan. The *Risk Appetite Statement* sets limits on how market risks can affect the funded status of the Plan in two stress scenarios. These stress scenarios represent severe stagflation and deflationary market conditions. In each scenario, the value of assets and liabilities is recalculated and the change in funded status is monitored. The drawdown in funded status for these two scenarios is monitored and used as a strategic risk limit. The table below highlights the potential reduction in funded status in the two stress scenarios.

As at December 31	2019	2018
	% Potential reduction to funded status	% Potential reduction to funded status
Risk appetite statement scenario A[a]	**12.5%**	9.4%
Risk appetite statement scenario B[b]	**10.7%**	9.5%

a Under Scenario A, the assumption is that the MSCI World Index decreases by 30% while the 10 year government yield increases by 100 basis points.

b Under Scenario B, the assumption is that the MSCI World Index decreases by 30%, while the 10 year government yield decreases by 100 basis points.

7. Contributions

For the years ended December 31 ($ millions)	2019	2018
Members		
Current service[a]	**247**	241
Prior service	**14**	14
Long-term income protection[b]	**15**	13
	276	268
Employers		
Current service[a]	**247**	241
Prior service	**7**	7
Long-term income protection[b]	**15**	13
	269	261
Transfers from other plans	**7**	10
TOTAL CONTRIBUTIONS	**552**	539

a All contributions paid by members for current service are required contributions.

b The employer pays member contributions for long-term income protection.

As at December 31, 2019 employers' and members' contributions receivable were in the amount of $28 million (2018 – $31 million) and $21 million (2018 – $21 million) respectively. OPTrust has a process which reconciles contributions for each employer on a member-by-member basis.

8. Benefits Paid

For the years ended December 31 ($ millions)	2019	2018
Retirement pensions	**852**	822
Transfers to Public Service Pension Plan	**42**	115
Refunds, commuted value transfers and deaths	**82**	69
Transfers to other plans	**8**	7
TOTAL BENEFITS PAID	**984**	1,013

9. Administrative Expenses

Investment administrative expenses[a]

For the years ended December 31 ($ millions)	2019	2018
Administration	**39**	42
Professional services[b]	**4**	5
Custodial fees	**1**	1
TOTAL INVESTMENT ADMINISTRATIVE EXPENSES	**44**	48

Pension administrative expenses[a]

For the years ended December 31 ($ millions)	2019	2018
Administration	**30**	23
Professional services[b]	**2**	1
TOTAL PENSION ADMINISTRATIVE EXPENSES	**32**	24

a Includes corporate expenses.

b Total professional services include external audit expense of $469 thousand in 2019 (2018 - $411 thousand) and actuarial expense of $402 thousand in 2019 (2018 - $581 thousand).

10. Guarantees, Commitments and Contingencies

In the normal course of business, certain OPTrust entities may, from time to time, provide guarantees to various counterparties and enter into commitments to fund certain investments over the next several years in accordance with the terms and conditions agreed to, which may be considered material. OPTrust also enters into future lease commitments for office premises.

OPTrust's commitments, guarantees and leases are as follows:

As at December 31 ($ millions)	2019	2018
Investment commitments	**2,322**	2,464
Guarantees	**27**	28
Lease commitments	**9**	11
TOTAL COMMITMENTS, GUARANTEES AND LEASES	**2,358**	2,503

OPTrust indemnifies its Trustees and staff against certain claims that may be made against them to the extent that these individuals are not covered under other arrangements.

As at December 31, 2019, OPTrust was involved in litigation and claims which arise in the normal course of business. The outcome of such litigation and claims is often inherently difficult to predict. Any liability that may arise from these litigations has been recognized as appropriate or has been determined to have an insignificant impact on the financial statements.

11. Related Party Disclosures

In the normal course of business OPTrust purchased bonds at the prevailing market prices that were issued by the Province of Ontario, a sponsor of the Plan and whose employees are members of the Plan. The fair market value of the bonds as at December 31, 2019, was $3,722 million (2018 - $2,603 million). Investment income recorded on the bonds amounted to $100 million for the year-ended December 31, 2019 (2018 - $38 million).

12. Key Management Personnel Compensation

Key management personnel consist of senior executives having authority and responsibility for planning and directing the activities of OPTrust. The aggregate key management personnel compensation is shown below:

For the years ended December 31 ($ thousands)	2019	2018
Salaries, short-term employee benefits and termination benefits[a]	**6,644**	6,690
Post-employment benefits	**571**	429
Other long-term benefits	**1,673**	3,691
TOTAL	**8,888**	10,810

a Termination benefits include amounts settled during the year.

Ten-Year Financial Review (Unaudited)

As at December 31 ($ millions)	**2019**	2018	2017	2016	2015	2014	2013	2012	2011	2010
CHANGES IN NET ASSETS										
Changes due to investment activities	**2,217**	145	1,742	1,037	1,311	1,818	1,615	1,237	578	1,530
Changes due to pension activities	**(464)**	(498)	(497)	(391)	(393)	(289)	(368)	(235)	(192)	(202)
INCREASE/(DECREASE) IN NET ASSETS	**1,753**	(353)	1,245	646	918	1,529	1,247	1,002	386	1,328
NET ASSETS										
Investments										
Cash and short-term investments	**2,725**	3,406	3,332	2,417	1,460	2,750	2,275	2,251	2,296	1,395
Government and corporate bonds and debentures	**8,771**	6,285	5,573	4,227	3,854	2,001	1,629	1,887	2,201	2,282
Real return bonds	**1,059**	866	430	438	468	446	577	1,177	1,495	1,280
Bank loan notes	**—**	—	—	168	156	145	90	—	—	—
Public equity	**1,699**	1,425	2,318	3,422	5,497	5,738	5,749	4,664	4,213	5,731
Pooled and hedge funds	**4,866**	5,863	4,573	2,597	959	732	456	126	—	170
Real estate	**3,091**	2,927	2,823	2,884	2,857	2,394	2,167	2,148	1,802	1,419
Private equity	**2,797**	2,288	1,920	1,595	1,691	1,284	794	608	547	431
Infrastructure	**2,405**	2,476	2,136	2,065	2,350	2,055	2,337	1,852	969	648
Investment-related assets	**805**	324	481	132	108	154	151	149	265	142
	28,218	25,860	23,586	19,945	19,400	17,699	16,225	14,862	13,788	13,498
Contributions receivable	**49**	52	48	53	51	52	58	56	50	44
Other assets	**8**	11	5	4	5	4	5	5	6	2
TOTAL ASSETS	**28,275**	25,923	23,639	20,002	19,456	17,755	16,288	14,923	13,844	13,544
Liabilities										
Accounts payable and accrued charges	**(28)**	(39)	(44)	(49)	(54)	(78)	(69)	(64)	(64)	(57)
Investment-related liabilities	**(6,557)**	(5,947)	(3,305)	(908)	(1,003)	(196)	(267)	(154)	(77)	(170)
TOTAL LIABILITIES	**(6,585)**	(5,986)	(3,349)	(957)	(1,057)	(274)	(336)	(218)	(141)	(227)
NET ASSETS AVAILABLE FOR BENEFITS	**21,690**	19,937	20,290	19,045	18,399	17,481	15,952	14,705	13,703	13,317
Pension obligations	**(20,220)**	(18,453)	(18,265)	(17,316)	(16,756)	(15,937)	(14,958)	(14,189)	(13,499)	(12,923)
SURPLUS	**1,470**	1,484	2,025	1,729	1,643	1,544	994	516	204	394

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This report summarizes certain provisions of the OPSEU Pension Plan. Please note that this report does not create any rights to benefits not provided for in the actual terms of the Plan. In the event of any conflict or omission, the legal requirements of the OPSEU Pension Plan will govern in all cases.

ISSN 1204-0525

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