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## Quarterly Update on Estimated Solvency Funded Status of Defined Benefit Plans in Ontario

### Update as at March 31, 2019

- **The median solvency ratio is 96% (up from 94% as at December 31, 2018);**
- **36.6% of plans had a solvency ratio greater than 100% (up from 27.5% as at December 31, 2018);**
- **48.3% of plans had a solvency ratio between 85% & 100%; and**
- **15.1% of plans had a solvency ratio below 85% (down from 18.6% as at December 31, 2018).**

Ontario DB plan solvency positions recovered from decreases suffered in the fourth quarter of 2018 mainly due to robust pension fund investment returns partially offset by increased solvency liabilities related to decreased longer-term Canadian bond yields against which solvency liabilities are negatively correlated.

The 2% increase in the estimated median solvency ratio since December 31, 2018 is attributable to the following:

- 6% increase due to very strong estimated 8.3% after expense Q1 2019 pension fund investment returns; and
- 4% decrease due to Q1 2019 commuted value and annuity purchase proxy interest rate reductions.

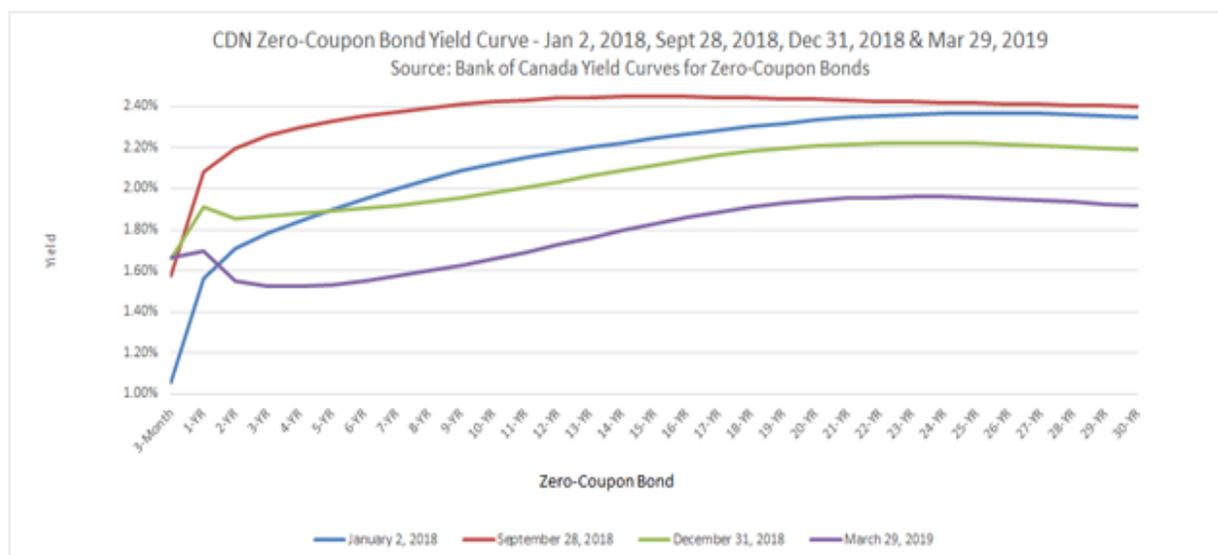
Although none of the geopolitical uncertainties existing at the end of 2018 moved closer to resolution and Canada became preoccupied with issues pertaining to SNC-Lavalin, equities nevertheless rose sharply in the first quarter, buoyed by decreasing interest rates. The S&P/TSX recorded an exceptional 13.3% increase. Despite an appreciating Cdn \$ against both the US \$ and €, very strong U.S. S&P 500 returns and positive EAFE markets resulted in MSCI World equities returning 10.0% (Cdn \$) in the first quarter.

Fixed income assets directly benefited from decreases in domestic interest rates across most durations in the first quarter. The FTSE TMX Universe was up 3.9% in the first quarter while 91-day T-Bills returned 0.4%. TMX Long Term bonds appreciated by 6.9% in response to Government of Canada marketable bond yields over 10-years falling 30 bps to 1.83% from 2.13% at December 31. However, decreases in Canadian bond yields also led to solvency liability increases.

Resulting median first quarter 2019 gross and net after expense IIS asset-weighted return

estimates are 8.5% and 8.3%, respectively.

## Other Funding Matters – Canadian Yield Curves



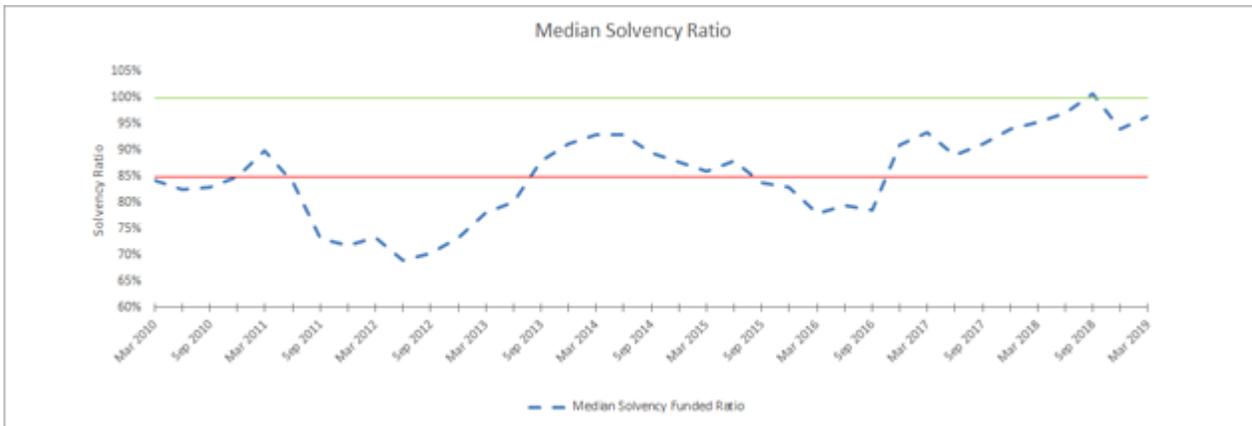
[View accessible description of Flattening Canadian Zero-Coupon Bond Yield Curve](#)

In Q1 2019, DB plan solvency liabilities increased sharply as a result of the approximately 20 bps parallel drop in the yield curve and resultant commuted value and annuity proxy interest rate reductions.

From January 2, 2018's rising yield curve, Canada's yield curve has moved ever flatter and remains on the cusp of inversion. The gap between 3-month and 30-year zero-coupon bonds was 129 bps (2.35% - 1.06%) at January 2, 2018 but had shrunk to 83 bps (2.40% - 1.57%) at September 28, 2018, 53 bps at December 31, 2018 (2.19% - 1.66%) and was just 25 bps (1.92% - 1.67%) at March 29, 2019. From September 28, 2018 the 20-year vs. 30-year spread has been inverted (2.43% 20-year yield vs 2.40% 30-year yield at September 28, 2018, 2.21% 20-year yield vs 2.19% 30-year yield at December 31, 2018 and 1.94% 20-year yield vs 1.92% 30-year yield at March 29, 2019).

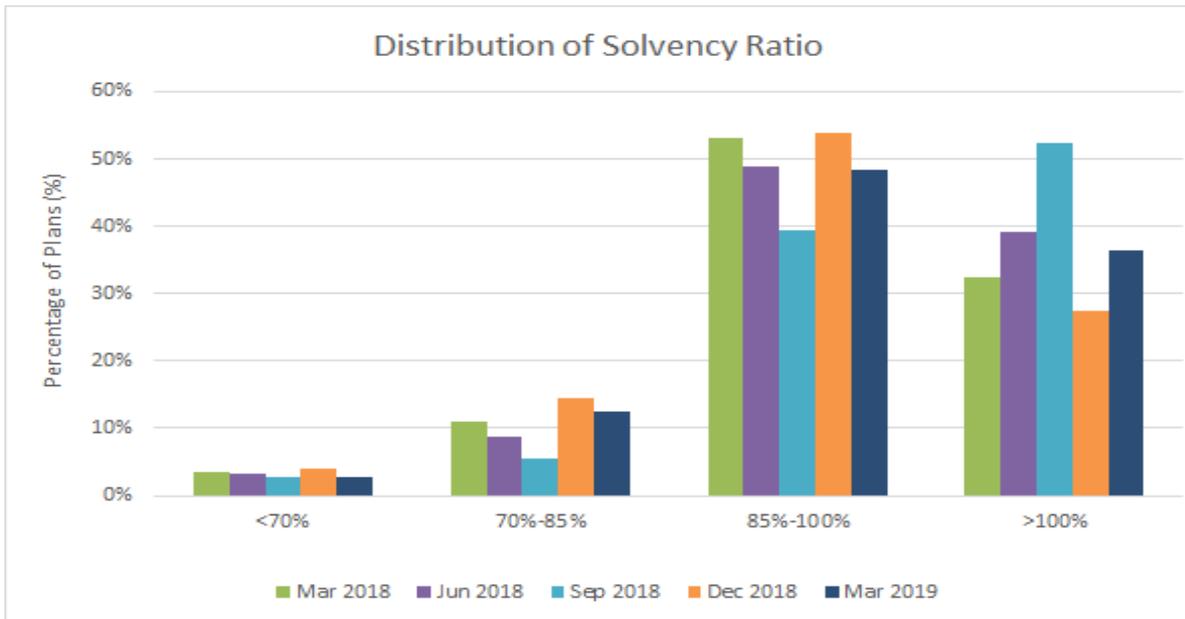
The last time Canada's long-term bonds yielded less than their shorter-term counterparts was in 2007 after which the global financial crisis followed in 2008. Although the relationship between Canadian yield curve inversions and recessions is less robust than in the U.S., economists and investors alike will be carefully dissecting future yield curve movements to help gauge the direction of Canada's economy.

## Median Solvency Ratio



[View accessible description of Median Solvency Ratio Line Chart](#)

### Distribution of Solvency Ratio



[View accessible description of Distribution of Solvency Ratio Bar Chart](#)

### Methodology and Assumptions:

1. The results reported in each plan's last filed actuarial valuation reports (assets and liabilities) were projected to March 31, 2019 based on these assumptions:
  - sponsors would use all available funding excess and prior year credit balance for contribution holidays, subject to any statutory restrictions;
  - sponsors would make normal cost contributions and special payments, if required, at the statutory minimum level;

- o cash outflows equal to pension amounts payable to retired members as reported in the last filed valuation report were assumed. Plan administration costs were not directly reflected in cash outflows, but indirectly through net, after expense investment earnings.

2. Each plan's annual net rates of return for years prior to 2018 are calculated based on individual plan filed IIS information. Rate of return statistics for 2017 and 2016 are summarized as follows

	5th Percentile	1st Quartile	2nd Quartile	3rd Quartile	95th Percentile
2017 Gross Return:	12.6%	10.0%	8.9%	7.6%	5.0%
2017 Net After Inv. Expense:	12.2%	9.6%	8.4%	7.2%	4.7%
2017 Net After All Expense:	11.6%	9.2%	7.9%	6.6%	3.8%
2016 Gross Return:	11.6%	8.1%	6.4%	4.7%	2.2%
2016 Net After Inv. Expense:	11.1%	7.6%	5.9%	4.3%	1.9%
2016 Net After All Expense:	10.6%	7.2%	5.4%	3.7%	1.0%

3. Each plan's unique quarterly returns were estimated based on each plan's 2017 filed IIS asset allocation in combination with market index returns, offset by a 25 basis point quarterly expense charge. Estimated plan gross and net after expense return statistics are as follows:

	5th Percentile	1st Quartile	2nd Quartile	3rd Quartile	95th Percentile
2019 Q1 Gross Return:	9.7%	9.2%	8.5%	7.4%	5.4%
2019 Q1 Net After All Expense:	9.5%	8.9%	8.3%	7.2%	5.1%
2018 Gross Return:	0.9%	-0.7%	-1.7%	-2.3%	-3.0%

2018 Net After All Expense	-0.1%	-1.7%	-2.6%	-3.3%	-4.0%
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The following table summarizes 2017 average IIS plan asset allocations by major asset class:

Cash	Canadian Equities	Foreign Equities	Fixed Income <sup>1</sup>	Real Estate	Other
2.9%	23.7%	23.0%	44.8%	3.0%	2.6%

<sup>1</sup> 50% FTSE TMX Universe Bonds and 50% FTSE TMX Long Term Bonds.

Market index returns on the major assets classes have been as follows:

	S&P / TSX Total Return Index	MSCI World Total Net Return Index	FTSE TMX Universe Bond Index	FTSE TMX Long Bond Index
<b>Q1 2019</b>	13.3%	10.0%	3.9%	6.9%

4. Estimated solvency liabilities were calculated based on the Canadian Institute of Actuaries Standards of Practice and the Canadian Institute of Actuaries Educational Notes, with these key assumptions:

Valuation Date	Commuted Value Basis	Annuity Purchase Basis <sup>2</sup>
March 31, 2019	Interest: 2.70% for 10 years 3.20% thereafter Mortality: CPM2014 generational	Interest: 2.93% Mortality: CPM2014 generational
December 31, 2018	Interest: 3.20% for 10 years, 3.40% thereafter Mortality: CPM2014 generational	Interest: 3.13% Mortality: CPM2014 generational

<sup>2</sup> based on a medium duration illustrative block