



Financial Services
Commission
of Ontario



Commission des
services financiers
de l'Ontario

2018 Report on the Funding of Defined Benefit Pension Plans in Ontario

Financial Services Commission of Ontario

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Contents

1.0	EXECUTIVE SUMMARY	4
1.1	Risk-Based Monitoring	4
1.2	Current Funding Regime	4
1.3	Key Findings.....	5
	General Funded Status	5
	Solvency Funding	6
	Fund Investment	7
2.0	FUNDING DATA.....	8
2.1	Summary of Funding Data	9
2.2	Summary of Actuarial Assumptions and Methods.....	11
3.0	2018 FUNDING REGIME FOR DB PLANS.....	15
3.1	New 2018 Funding Framework	15
	Going-concern Funding	15
	Solvency Funding / Reduced Solvency Deficiency.....	16
	Available Actuarial Surplus.....	16
3.2	Specified Ontario Multi-Employer Pension Plans (SOMEPPs).....	17
3.3	Solvency Funding Relief for Public Sector Pension Plans	19
3.4	Solvency Funding Relief for Private Sector Pension Plans.....	19
4.0	TRENDS ANALYSIS.....	21
4.1	Solvency Funded Status	21
4.2	Actuarial Assumptions	24
	Going-Concern Interest Rate	24
	Solvency Interest Rates.....	25



5.0	INVESTMENT	27
5.1	Summary of Pension Fund Profiles and Performance.....	27
5.2	Additional Information	31
	By Solvency Ratio (for plans other than Listed JSPPs)	31
	By Percentages Invested in Pooled Funds (for plans other than Listed JSPPs)	32
6.0	BASELINE PROJECTIONS	33
6.1	Estimated DB Funding Contributions in 2019.....	33
6.2	Projected Financial Position as at December 31, 2018.....	34
	December 31, 2018 Solvency Position Projection	34
	December 31, 2018 Going-Concern Position Projection	34
	Methodology and Assumptions	35
7.0	GLOSSARY.....	37
8.0	APPENDIX – ADDITIONAL INFORMATION	39



1.0 EXECUTIVE SUMMARY

The Financial Services Commission of Ontario (FSCO) is an agency of the Ministry of Finance that regulates Ontario registered pension plans in accordance with the Pension Benefits Act (PBA) and Regulation 909 or any other regulations under the PBA, as amended.

FSCO has prepared this report (2018 Report) to provide pension stakeholders with up-to-date funding, investment and actuarial information related to defined benefit (DB) pension plans in Ontario. Information in this report is based on the latest filed valuation reports for DB pension plans that have valuation dates between July 1, 2015 and June 30, 2018, and fund financial statements for the fiscal year ending between July 1, 2017 and June 30, 2018. Information is presented on an aggregate basis and there is no disclosure of plan-specific information.

1.1 RISK-BASED MONITORING

FSCO adopted a comprehensive and integrated approach towards assessing pension plan risks. As part of the Risk-Based Regulation (RBR) framework, FSCO focuses on five broad risk categories: Funding, Investment, Administration, Governance, and Sponsor/Industry. Within each risk category, FSCO identifies certain quantifiable risk indicators/factors. Pension plans are scored based on each of these risk indicators. These indicators are then tabulated, aggregated and ranked via a Risk Indicator Tool (RIT) to prioritize the plans to be selected for a more detailed risk assessment through a Tier 1 and/or Tier 2 review. Specifically, funding and investment risks are assessed based on key actuarial, financial and investment data collected through the Actuarial Information Summary (AIS) and the Investment Information Summary (IIS) filed with FSCO.

These past risk-based monitoring activities have yielded valuable information on how risk-based regulation of pension plans can be improved upon and taken to the next level by the Financial Services Regulatory Authority of Ontario (FSRA)¹ when it becomes operational in 2019.

1.2 CURRENT FUNDING REGIME

2018 marked a new pension funding era in Ontario. On May 1, 2018, a new funding framework for DB pension plans became effective. Key features include:

- Shortening the amortization period from 15 years to 10 years for funding a going-concern unfunded liability in a plan;
- Consolidating going-concern special payments into a single schedule when a new report is filed;

¹ FSRA is a new, independent regulatory agency created to improve consumer and pension plan beneficiary protections in Ontario. It will be assuming pension plan regulatory activities currently performed by FSCO.



- Requiring the funding of a reserve, called a Provision for Adverse Deviations (PfAD), within the plan;
- Requiring funding on a solvency basis only if needed to improve the plan's funded status to 85% on a solvency basis; and
- Providing funding rules for benefit improvements and restricting contribution holidays to improve benefit security.

These changes apply to valuation reports filed on or after May 1, 2018 with a valuation date on or after December 31, 2017. However, these changes do not apply to jointly sponsored pension plans that are listed in subsection 1.3.1(3) of Regulation 909 (Listed JSPPs) – these JSPPs remain exempted from solvency funding. In addition, these changes also do not apply to Specified Ontario Multi-Employer Pension Plans (SOMEPPs). Effective July 1, 2018, temporary funding relief previously granted for SOMEPPs was extended to the earlier of the first anniversary of the date on which section 81.0.2 of the PBA (Conversion to Target Benefits) comes into force and January 1, 2024. During this period, SOMEPPs are exempt from the requirement to fund on a solvency basis.

This funding reform substantially ends a series of temporary solvency funding relief measures that were introduced over the past decade. The remaining solvency funding relief measures are generally of a transitional nature.

1.3 KEY FINDINGS

The 2018 Report's key findings summarized below are based on actual information from actuarial valuation reports filed with FSCO with valuation dates between July 1, 2015 and June 30, 2018. Therefore, except as otherwise noted, the summary statistics drawn from the three-year period do not have a common valuation date.

General Funded Status

1. The distribution of the 1,364 pension plans analyzed based on their most recently filed valuation report are as follows:

	July 1, 2015 - June 30, 2016	July 1, 2016 - June 30, 2017	July 1, 2017 - June 30, 2018	Total
Number of Plans	141	388	835	1,364
Percentage of Plans	10%	29%	61%	100%

2. Overall, compared to what was reported in the 2017 Report on the Funding of Defined Benefit Pension Plans in Ontario ([2017 Report](#)), the funded position of the pension plans analyzed by FSCO remained approximately the same on a going-concern basis but improved slightly on a solvency basis:
 - the median funded ratio on a going-concern basis has stayed at 111%; and
 - the median funded ratio on a solvency basis has increased from 91% to 94%.



3. There was an increase in the percentage of pension plans that were fully funded on a going-concern basis and on a solvency basis at their last valuation date:
 - 80% of the plans were fully funded on a going-concern basis (versus 78% in the 2017 Report); and
 - 28% of the plans were fully funded on a solvency basis (versus 22% from the 2017 Report).
4. The average interest rate assumption used for going-concern valuations decreased from 5.06% to 5.02% over the four-year period from July 1, 2014 to June 30, 2018. However, 12% of the actuarial valuation reports included in our analysis with valuation dates between July 1, 2017 and June 30, 2018 used an interest rate equal to or greater than 6.00% and 39% used an interest rate equal to or greater than 5.50% (increased from 8% and 25% respectively for those reports with valuation dates between July 1, 2016 and June 30, 2017).
5. 693 plans have transitioned to the new 2018 funding regime. The number of plans identified as closed and open are 545 and 148 respectively. The median PfAD for all 693 plans is 9.9%.
6. The minimum required contributions for 2019 including employer normal cost contributions, member required contributions and special payments, are estimated to be \$17.6 billion which includes the contributions required by the seven large public sector pension plans previously excluded in the 2017 Report.

Solvency Funding

FSCO estimates the projected solvency ratio for all the pension plans (other than the Listed JSPPs) from the dates of their latest filed reports to a common measurement date of December 31, 2018. The median projected solvency ratio is 94% as at December 31, 2018, compared to 96% as at December 31, 2017. Specifically,

- 27% of the plans had a projected solvency ratio greater than 100% (up from the projected 25% as at December 31, 2017);
- 54% of the plans had a projected solvency ratio between 85% and 100%; and
- 19% of the plans had a projected solvency ratio below 85% (which is about the same as at December 31, 2017).

Statistics on the remaining transitional solvency funding relief measures include:

1. Of the 73 multi-employer pension plans (MEPPs) that contain a DB provision, 56 have elected to be treated as a SOMEPP. These 56 SOMEPPs represent 95% of the total plan membership covered by the 73 MEPPs.
2. The opportunity for pension plans in the public sector and broader public sector to apply for the temporary solvency funding relief was first introduced in 2011 as outlined in O. Reg. 178/11. The relief measures were amended and extended between 2013 and 2017. Based on the latest actuarial valuation reports included in this 2018 Report, there are still 24 pension plans in receipt of Stage 2 solvency funding relief under O. Reg. 178/11 and have yet to be transitioned to the new funding framework with their next filing. Conditions and restrictions on contribution holidays and



benefit improvements under O. Reg. 178/11 continue to apply until stipulations prescribed thereunder are satisfied. At the time of this report, a number of these plans have been or in the process of transitioning from this funding relief by merging with other pension plans.

3. The opportunity for private sector plans to elect temporary solvency funding relief was first introduced in 2009 and was subsequently amended and extended in 2012, 2016 and 2017. Based on the latest actuarial valuation reports included in this 2018 Report, there are still 130 pension plans in receipt of solvency funding relief under sections 5.6.2 and 5.6.3 of Regulation 909 and have yet to be transitioned to the new funding framework with their next filing.

Fund Investment

1. The typical asset allocation of pension funds between fixed income and non-fixed income did not change significantly, but the allocation to alternative investments and real estate has increased, particularly for the larger plans.
 - Listed JSPPs have significantly more allocation to cash and fixed income assets (average of 54% vs 44% for the single employer pension plans (SEPPs)) and substantially less allocation to public equities (average of 19% vs 42% for the SEPPs).
 - MEPPs have significantly less allocation to cash and fixed income assets (average of 34%).
2. Larger plans generally have higher investment returns and lower investment fees than smaller plans.
 - Average gross investment return for plans (other than the Listed JSPPs) that have assets of less than \$10 million is 8.3% (with an average investment fee of 0.5%) vs 9.4% for those with assets of over \$1 billion (with an average investment fee of 0.3%).
 - Average gross investment return for the SEPPs is 8.7% (with an average investment fee of 0.4%).
 - Average gross investment return for the MEPPs is 8.5% (with an average investment fee of 0.4%).
 - Average gross investment return for the Listed JSPPs is 10.7% (with an average investment fee of 0.4%).



2.0 FUNDING DATA

This section provides an analysis and summary of the funding data, including actuarial assumptions and methods, for DB pension plans with valuation dates between July 1, 2015 and June 30, 2018. The data was compiled from the AIS and actuarial valuation reports that FSCO received on or before the data cutoff date of December 31, 2018.

Generally, valuation reports must be filed once every three years on both a going-concern and solvency basis. However, solvency concerns revealed in an actuarial valuation report require annual filing until those concerns are eliminated. Early filings may be required when events such as plan mergers or sales of businesses occur, and may also be done on a voluntary basis. Unless otherwise noted, the analysis in this 2018 Report is based on data from each plan's most recently filed actuarial valuation report in order to avoid double counting.²

For the purposes of this 2018 Report, the following plans are excluded in order to focus on the plans that are of most interest to our stakeholders and to ensure that the results of our analysis are not skewed:

- designated plans;
- individual pension plans; and
- plans that have been wound up or are in the process of winding up.

It should be noted that the 2018 Report now includes seven large public sector plans (comprising of six Listed JSPPs and one single employer pension plan) that were excluded from previous DB Funding Reports.

² The Trends Analysis in Section 4 uses data from reports with valuation dates in the different periods and therefore may include more than one valuation report from any given pension plan.



Table 2.1 presents the profile of the 1,364 pension plans that have been included in the funding data analysis in this 2018 Report. Additional details on these plans are included in Section 8.0.

Table 2.1 - Summary of Plans Included

Plan/Benefit Type	# of Plans	Active Members	Retired Members	Other Participants	Total Membership	Market Value of Assets (in Millions)
Final Average	354	153,322	133,725	42,196	329,243	\$91,823
Career Average	94	25,000	20,111	9,405	54,516	\$8,659
Flat Benefit	157	23,564	33,407	11,457	68,428	\$10,204
Hybrid	384	163,448	217,997	88,665	470,110	\$88,524
Frozen DB & Hybrid	295	24,277	65,198	25,093	114,568	\$16,328
MEPP	73	393,474	135,805	438,358	967,637	\$35,924
Listed JSPP	7	762,751	456,139	154,235	1,373,125	\$399,380
Total	1,364	1,545,836	1,062,382	769,409	3,377,627	\$650,842
Average Age		44.5	72.9	48.1		

2.1 SUMMARY OF FUNDING DATA

Of the 1,364 plans that were analyzed, which together cover 3,377,627 plan members, 270 plans (20%) were less than fully funded on a going-concern basis. These 270 underfunded plans cover 1,484,017 (44%) of the total plan members.

On a solvency basis, 984 plans (72%) of the 1,364 plans were less than fully funded. These 984 plans cover 2,391,984 plan members (71% of total members).

Tables 2.2 and 2.3 show the distribution of underfunded plans by plan/benefit type and by membership.

Table 2.2 – Distribution of Underfunded Plans on a Going-Concern Basis by Plan Type and Membership

Plan/Benefit Type	By Plan			By Membership		
	Total Number of Plans	Number of Underfunded Plans	% of Total Plans	Total Number of Members	Number of Members in Underfunded Plans	% of Total Membership
Final Average	354	65	18%	329,243	139,592	42%
Career Average	94	16	17%	54,516	22,749	42%
Flat Benefit	157	13	8%	68,428	3,800	6%
Hybrid	384	87	23%	470,110	90,430	19%
Frozen DB & Hybrid	295	64	22%	114,568	36,555	32%
MEPP	73	22	30%	967,637	687,247	71%
Listed JSPP	7	3	43%	1,373,125	503,644	37%
Total	1,364	270	20%	3,377,627	1,484,017	44%



Table 2.3– Distribution of Underfunded Plans on a Solvency Basis by Plan Type and Membership

Plan/Benefit Type	By Plan			By Membership		
	Total Number of Plans	Number of Underfunded Plans	% of Total Plans	Total Number of Members	Number of Members in Underfunded Plans	% of Total Membership
Final Average	354	247	70%	329,243	260,161	79%
Career Average	94	76	81%	54,516	41,690	76%
Flat Benefit	157	120	76%	68,428	56,815	83%
Hybrid	384	281	73%	470,110	359,714	77%
Frozen DB & Hybrid	295	191	65%	114,568	89,611	78%
MEPP	73	64	88%	967,637	941,710	97%
Sub-Total	1,357	979	72%	2,004,502	1,749,701	87%
Listed JSPP	7	5	71%	1,373,125	642,283	47%
Total	1,364	984	72%	3,377,627	2,391,984	71%

Table 2.4 provides summary information grouped by plan maturity (as measured by the proportion of solvency liabilities relating to pensioners versus the plan's total solvency liabilities).

Table 2.4 – Funding Information Grouped By Maturity

Proportion of Solvency Liabilities relating to Pensioners	# of Plans	Total Membership	Solvency Assets (in Millions)	Solvency Liabilities (in Millions)	Solvency Ratio	Ratio of Active Members to Pensioners
Less than 25%	187	265,487	\$15,276	\$18,535	82%	4.1 : 1
25% ≤ ratio < 50%	561	1,109,193	\$90,159	\$109,360	82%	2.1 : 1
50% ≤ ratio < 75%	414	460,864	\$111,892	\$118,805	94%	1.0 : 1
75% and over	195	168,958	\$33,710	\$35,582	95%	0.1 : 1
Sub-Total	1,357	2,004,502	\$251,037	\$282,282	89%	1.5 : 1
Listed JSPP	7	1,373,125	\$398,665	\$359,215	111%	1.7 : 1
Total	1,364	3,377,627	\$649,702	\$641,497	101%	1.5 : 1

Tables 2.5 and 2.6 provide a more detailed breakdown of the going-concern and solvency funded ratios with respect to different types of DB pension plans. The median funded ratio was 111% on a going-concern basis and 94% on a solvency basis, for all plans that were analyzed. 52 of the 73 MEPPs (or 71%) had a solvency ratio of less than 85%.

Table 2.5 – Going-Concern Funded Ratio (GCR)

Ratio (GCR)	Final Average	Career Average	Flat Benefit	Hybrid	Frozen DB & Hybrid	MEPP	Listed JSPP	All Plans
GCR < 0.60	1	0	0	2	2	0	0	5
0.60 ≤ GCR < 0.80	3	0	1	8	6	0	0	18
0.80 ≤ GCR < 0.90	16	7	2	14	24	4	0	67
0.90 ≤ GCR < 1.00	45	9	10	63	32	18	3	180
1.00 ≤ GCR < 1.20	195	48	74	195	149	36	3	700
1.20 ≤ GCR	94	30	70	102	82	15	1	394
Total	354	94	157	384	295	73	7	1,364
Median Ratio	1.10	1.10	1.16	1.09	1.09	1.05	1.02	1.11



Table 2.6 – Solvency Funded Ratio (SR)

Ratio (SR)	Final Average	Career Average	Flat Benefit	Hybrid	Frozen DB & Hybrid	MEPP	Sub-Total	Listed JSPP	All Plans
SR < 0.60	1	0	1	0	1	15	18	0	18
0.60 ≤ SR < 0.80	20	9	14	13	12	33	101	2	103
0.80 ≤ SR < 0.85	27	17	14	26	20	4	108	1	109
0.85 ≤ SR < 0.90	72	18	33	72	40	6	241	1	242
0.90 ≤ SR < 1.00	127	32	58	170	118	6	511	1	512
1.00 ≤ SR < 1.20	89	14	32	87	78	7	301	1	308
1.20 ≤ SR	18	4	5	16	26	2	71	1	72
Total	354	94	157	384	295	73	1,357	7	1,364
Median Ratio	0.95	0.89	0.90	0.95	0.97	0.76	0.94	0.88	0.94

2.2 SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

The key actuarial assumptions and methods used in going-concern valuations are outlined below:

1. Almost all the plans used the unit credit cost method (with salary projections for plans with benefits based on final average earnings) to calculate going-concern liabilities.

Table 2.7 – Liability Valuation Method

Liability Valuation Method	# of Plans	% of Plans
Unit Credit (with salary projection)	829	60.8%
Unit Credit (with no salary projection)	529	38.8%
Entry Age Normal	1	0.1%
Aggregate	5	0.3%
Total	1,364	100.0%

2. Almost all plans used a market or market-related value of assets.

Table 2.8 – Asset Valuation Method

Asset Valuation Method	# of Plans	% of Plans
Market	1,050	77.0%
Smoothed Market	303	22.2%
Other	11	0.8%
Total	1,364	100.0%

3. For going-concern valuations, almost all plans used mortality rates based on the Canadian Pensioners' Mortality tables (CPM-RPP2014) and improvement scales published in the Final Report, Canadian Pensioners' Mortality on February 13, 2014 by the Canadian Institute of Actuaries (2014 CIA CPM Study). The 2014 CIA CPM Study includes three new sets of mortality tables as well as two sets of improvement scales. The three mortality tables are:
 - 2014 Mortality Table (CPM2014) – developed from the combined experience exhibited under the public and private sector plans;



- 2014 Public Sector Mortality Table (CPM2014Publ) – based on the separate experience exhibited under the public sector plans; and
- 2014 Private Sector Mortality Table (CPM2014Priv) – based on the separate experience exhibited under the private sector plans.

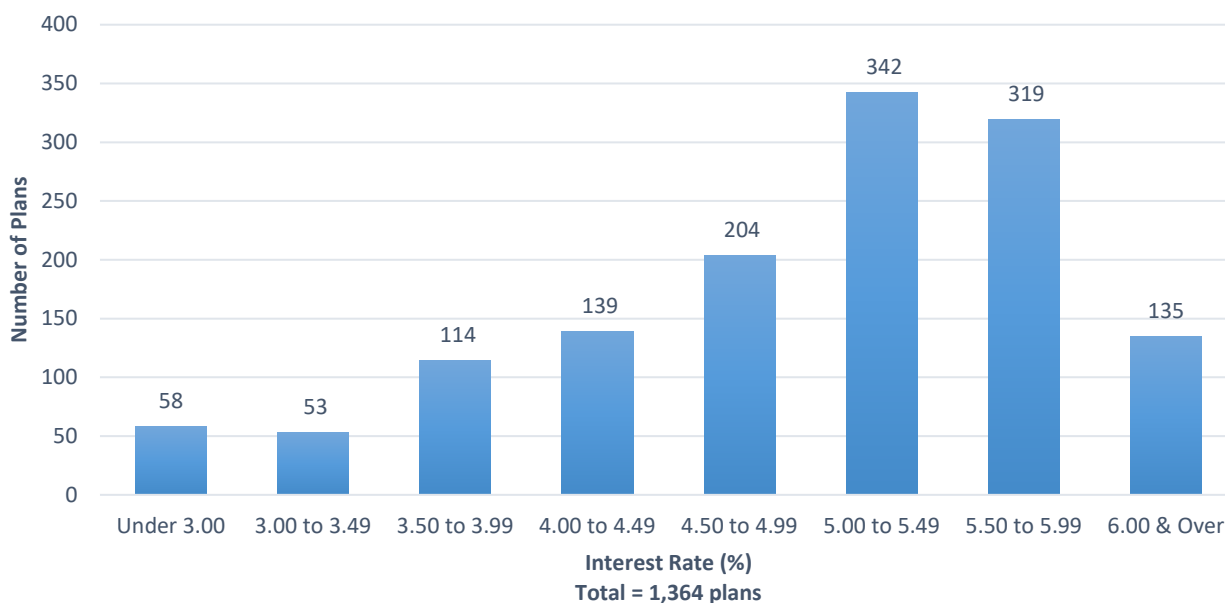
Table 2.9 – Mortality Assumption

Mortality Base Table	# of Plans	% of Plans	Adjustment		
			# of Plans		Median Adjustment
			Male Mortality	Female Mortality	
1994 UP	8	0.6%	0	0	n/a
CPM-RPP2014	1,344	98.5%	378	379	105%
Other (Custom)	12	0.9%	n/a	n/a	n/a
Total	1,364	100.0%			

4. Interest rate assumptions used to value the going-concern liabilities were generally higher than in prior years, with over 33% (versus 28% in the 2017 Report) of plans using a rate of 5.50% or higher.

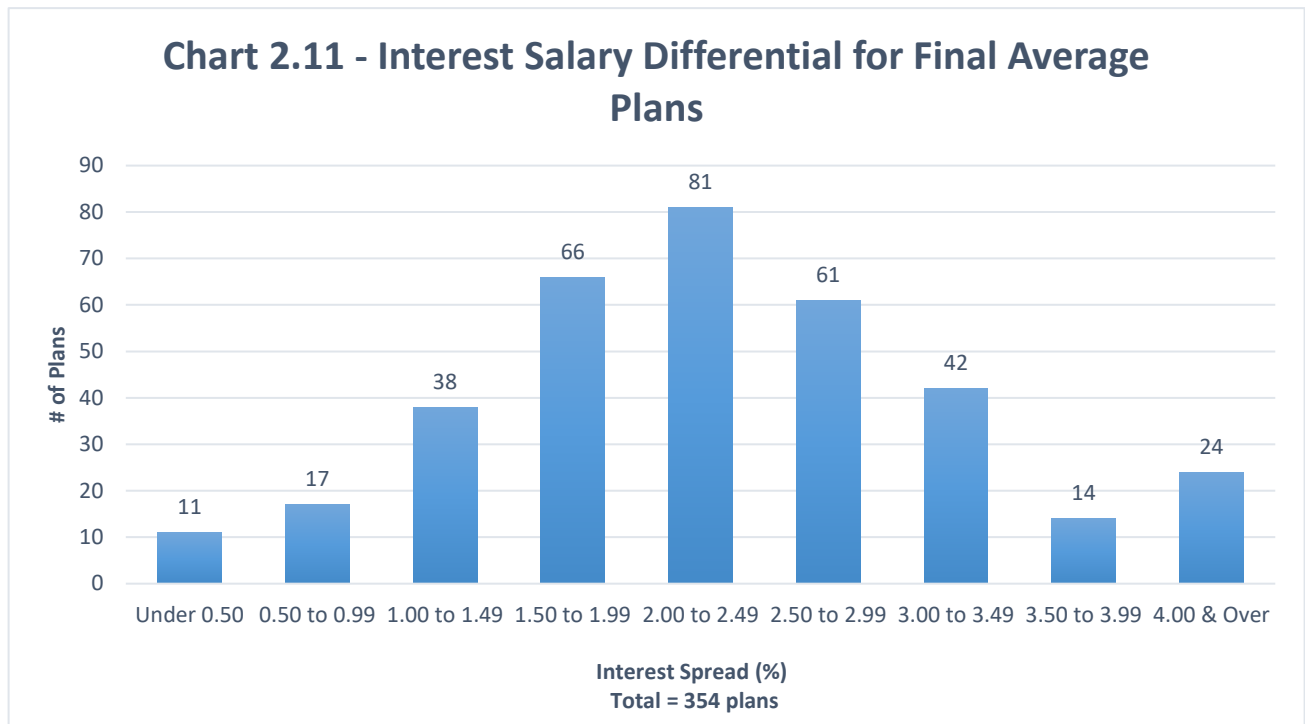
Of the 135 plans that used a going-concern interest rate assumption of 6.00% or over, 86 plans used an interest rate of exactly 6.00%. Of the 342 plans that used a going-concern interest rate assumption in the range of 5.00% to 5.49%, 122 plans used an interest rate of exactly 5.00%.

Chart 2.10 - Going-Concern Interest Assumption





5. For final average earnings plans, the difference between the interest assumption and the salary increase assumption used in going-concern valuations, typically fell within a range of 1.5% to 3.0% inclusive. This accounts for 63% (including 16 plans which had an interest-salary differential of exactly 3.00% but were grouped as part of the 42 final average plans with an interest-salary differential in the range of 3.00% to 3.49%) of all plans providing final average benefits. The average spread between the interest assumption and the salary increase assumption was 2.27%.





6. Table 2.12 shows the provision for wind up expenses used in solvency valuations, grouped by plan membership size, including active members, former members and other plan beneficiaries.

The expense allowance is also expressed as average dollar amounts per plan and per plan member. The average expense allowance per member generally decreases as plan membership size increases. The reverse pattern appears for plans with 10,000 or more members. Since there are only a small number of plans in the last two size categories (i.e., more than 10,000 members), greater caution should be exercised when interpreting the results for plans of this size.

The average per member wind up expense allowances are generally comparable to those reported in the [2017 Report](#).

Table 2.12 – Provision for Wind Up Expenses

Plan Membership	# of Plans	Total Membership	Wind Up Expenses		
			Total Wind Up Expenses	Average Per Plan	Average Per Member
<100	470	20,941	\$30,940,000	\$65,830	\$1,477
100-499	491	116,035	\$71,258,000	\$145,128	\$614
500-999	154	107,521	\$44,168,000	\$286,805	\$411
1,000-4,999	175	376,711	\$106,256,000	\$607,177	\$282
5,000-9,999	41	299,780	\$52,191,000	\$1,272,951	\$174
10,000-49,999	25	470,208	\$185,584,000	\$7,423,360	\$395
50,000+	8	1,986,431	\$790,000,000	\$98,750,000	\$398
All Plans	1,364	3,377,627	\$1,280,397,000	\$938,708	\$379



3.0 2018 FUNDING REGIME FOR DB PLANS

O. Reg. 250/18 was filed on April 20, 2018 with most provisions coming into force on May 1, 2018. It amended Regulation 909 and set out the new funding framework for most DB pension plans.

The funding provisions outlined within O. Reg. 250/18 apply to actuarial valuations with a valuation date of December 31, 2017 or later, and filed after April 30, 2018. The new funding rules do not apply to Listed JSPPs. The changes also do not apply to SOMEPPs, but apply to MEPPs providing DB pensions that are not SOMEPPs.

This funding reform substantially ends a series of temporary solvency funding relief measures that were introduced over the past decade. The remaining solvency funding relief measures are generally of a transitional nature.

3.1 NEW 2018 FUNDING FRAMEWORK

O. Reg. 250/18 made substantial changes to both the going-concern and solvency funding rules.

Going-concern Funding

Pension plans are required to establish and fund a Provision for Adverse Deviations (PfAD) on a going-concern basis.

Going-concern unfunded liabilities are amortized over a period not exceeding 10 years with special payments commencing up to one year after the valuation date. These going-concern special payments (with the exception of those related to benefit improvements and benefit credits prior to the effective date of the plans) are consolidated at each valuation date into a single payment schedule.

The PfAD is calculated as a percentage that is applied to the going-concern liabilities as well as the normal costs. For the purpose of applying of PfAD, liabilities and normal costs relating to escalated adjustments may be excluded. The PfAD is established as the sum of three components:

1) *Open/Closed Plan Component*

The first component depends on whether the plan meets the definition of a closed plan. According to subsection 11.2(1) of Regulation 909, a “closed plan” is defined as a plan “at least one portion of which, according to the terms of the plan, does not permit new members to join and accrue defined benefits”. A fixed component of 5.0% is applicable for closed plans and 4.0% is applicable for plans that are not closed plans.

2) *Asset Mix Component*

The second component depends on the plan’s target asset allocation to fixed income assets and to non-fixed income assets. Regulation 909 sets out a minimum rating for target investment



allocations of fixed income assets. The asset mix component of the PfAD ranges between 0% and 23% for closed plans and between 0% and 12% for plans that are not closed plans.

3) *Benchmark Discount Rate (BDR) Component*

The third component is a function of the plan's gross going-concern discount rate in relation to the benchmark discount rate (BDR) as defined in section 11.2 of Regulation 909. Our analysis indicates that for many plans, the BDR component is 0% (see Table 3.2).

Solvency Funding / Reduced Solvency Deficiency

Solvency funding is only required for plans that are less than 85% funded on a solvency basis.

Solvency deficiencies below the 85% threshold, defined in Regulation 909 as a "Reduced Solvency Deficiency" must be amortized over a period not exceeding 5 years with solvency special payments commencing up to one year after the valuation date.

The reduced solvency deficiency, as defined in section 1.3.2 of Regulation 909, is the amount by which "A" exceeds "B" where,

"A" is the sum of,

- (a) 85 per cent of the pension plan's solvency liabilities,
- (b) 85 per cent of the pension plan's solvency liability adjustment, and
- (c) the pension plan's prior year credit balance as of the valuation date; and

"B" is the sum of the pension plan's solvency assets and the solvency asset adjustment as of the valuation date.

Available Actuarial Surplus

Under the new regime, a pension plan cannot take a contribution holiday unless a cost certificate certifying that the plan has available actuarial surplus is filed with FSCO within 90 days of the beginning of the plan fiscal year. Available actuarial surplus (for a plan for which special payments are not required or deferred), as defined in section 7.0.2 of Regulation 909, is the lesser of the following:

- i. The amount by which the value of the assets of the pension plan, determined on a going-concern basis, including accrued and receivable income but excluding the amount of any letter of credit held in trust for the pension plan, exceeds the sum of going-concern liabilities, the amount equal to the provision for adverse deviations in respect of going-concern liabilities and the prior year credit balance; and
- ii. Whichever of the following amounts applies to the plan:
 - a) In the case of a plan that is a public sector pension plan, the amount that, if it were deducted from the solvency assets of the pension plan, would reduce the solvency ratio to 1.05.



- b) In the case of any other plan, the amount that, if it were deducted from the solvency assets of the pension plan, would reduce the transfer ratio to 1.05.

693 plans have filed a valuation report under the new 2018 funding regime. Table 3.1 presents a profile of these pension plans and Table 3.2 summarizes the PfAD components

Table 3.1 – Plans under 2018 New Funding Regime

Type	# of Plans	Active	Retired	Other	Total Membership	Market Value of Assets	Going-Concern Liabilities	Average GC Ratio
						(in Millions)		
Open	148	140,820	109,046	46,417	296,283	\$68,853	\$65,152	105.7%
Closed	545	114,755	147,170	72,872	334,797	\$62,094	\$55,711	111.5%
Total	693	255,575	256,216	119,289	631,080	\$130,947	\$120,863	108.3%

Table 3.2 – PfAD Components

Type	# of Plans	Asset Mix Component		BDR Component			Median PfAD
		Median Fixed Income %	Median Asset Mix PfAD	Median BDR	Median Gross GC Rate	# Plans BDR>GC Rate	
Open	148	40.0%	4.0%	6.36%	5.50%	146	8.0%
Closed	545	45.0%	6.0%	6.14%	5.30%	532	11.0%
Total	693	45.0%	5.0%	6.19%	5.35%	678	9.9%

It should be noted that the above information was captured by FSCO via a temporary ad hoc process since the AIS associated with the filings of the actuarial valuation reports had not been updated to reflect the new funding regime. FSCO is in the process of updating the AIS which will capture more accurate and relevant information with respect to the new funding regime. It is expected that the AIS will be available in the 2nd quarter of 2019 and the information to be captured under the new AIS would help inform FSCO/FSRA, and all its stakeholders, about pension plans' application of, and compliance with, the DB plan funding rules under the new regime.

3.2 SPECIFIED ONTARIO MULTI-EMPLOYER PENSION PLANS (SOMEPPS)

In August 2007, a temporary funding framework applicable to SOMEPPs was implemented. A MEPP that meets the definition and satisfies the eligibility criteria described in Regulation 909 is eligible to elect SOMEPP status. Any MEPPs that do not meet the prescribed definition and eligibility criteria for SOMEPP status are required to continue to fund on a solvency basis.

SOMEPPs are temporarily exempt from solvency funding; Contributions to these plans during the period covered by the valuation report must not be less than the sum of:

- the normal cost;
- the remaining special payments for any previously established going-concern unfunded liability;
- and



- the special payments for any new going-concern unfunded liability determined in the valuation report.

Any new going-concern unfunded liability must be liquidated over a period of 12 years. Furthermore, there are accelerated funding requirements for benefit improvements, requiring any increase in the going-concern unfunded liability as a result of the improvements to be liquidated over a period of eight years under prescribed conditions. There is no requirement to fund on a solvency basis during the period of temporary solvency funding relief, although solvency valuations are still required to be performed and their results must be set out in the valuation report.³

Effective July 1, 2018, this temporary exemption for solvency funding was extended to the earlier of the first anniversary of the date on which section 81.0.2 of the PBA (Conversion to Target Benefits) comes into force and January 1, 2024.

The following tables provide selected statistics on the MEPPs that contain a DB provision. Of these 73 MEPPs, 56 of them (covering over 95% of the total DB MEPP membership) have elected to become SOMEPPs.

Table 3.3 – Membership Information

	# of Plans	Total (Median) Membership Count			
		Active Members	Retired Members	Other Participants	Total
SOMEPPs	56	377,007 (968)	121,195 (648)	423,103 (1,053)	921,305 (3,198)
Non-SOMEPPs	17	16,467 (565)	14,610 (262)	15,255 (578)	46,332 (1,658)
Total (All DB MEPPs)	73	393,474 (923)	135,805 (589)	438,358 (790)	967,637 (2,684)

Table 3.4 – Funding Information

	Total (Median) Value			
	Market Value of Assets	Solvency Assets [‡]	Solvency Liabilities	Solvency Ratio
	(in Millions)			
SOMEPPs	\$31,156 (\$175.4)	\$30,966 (\$174.9)	\$48,470 (\$247.2)	63.9% (67.7%)
Non-SOMEPPs	\$4,768 (\$81.2)	\$4,682 (\$61.1)	\$4,805 (\$66.0)	97.4% (98.6%)
Total (All DB MEPPs)	\$35,924 (\$159.2)	\$35,648 (\$158.4)	\$53,275 (\$211.4)	66.9% (75.7%)

[‡] Market value of assets less provision for wind up expenses

The plans that qualify as SOMEPPs tend to be significantly larger than non-SOMEPPs, when measured by the size of their assets, liabilities or plan membership. For example, the median solvency liabilities for SOMEPPs is almost four times that of the non-SOMEPPs.

In terms of funding levels, SOMEPPs are significantly less well funded than non-SOMEPPs. The median solvency ratio for SOMEPPs is 68% compared to almost 99% for non-SOMEPPs.

³ More information on SOMEPPs is available at:

<http://www.fsco.gov.on.ca/en/pensions/actuarial/Pages/MEPPsolvency-qanda.aspx>



3.3 SOLVENCY FUNDING RELIEF FOR PUBLIC SECTOR PENSION PLANS

In May 2011, O. Reg. 178/11 implemented changes that provide solvency funding relief to certain pension plans in the public sector and broader public sector. The relief measures were amended and extended between 2013 and 2017. Based on the latest actuarial valuation reports included in this 2018 Report, there are still 24 pension plans in receipt of Stage 2 solvency funding relief under O. Reg. 178/11 and have yet to be transitioned to the new funding framework with their next filing. Conditions and restrictions on contribution holidays and benefit improvements under O. Reg. 178/11 continue to apply until the prescribed stipulations are satisfied. Table 3.5 presents the profile of the 24 remaining plans based on their most current valuation report.

Table 3.5 – Plans still funding under O. Reg. 178/11

# of Plans	Active Members	Retired Members	Other Participants	Total Membership	Market Value of Assets	Going-Concern Liabilities	Solvency Liabilities
					(in Millions)		
24	89,067	65,093	18,307	172,467	\$43,360	\$43,807	\$48,589

At the time of this report, a number of these plans have been or in the process of transitioning from this funding relief by merging with other pension plans.

3.4 SOLVENCY FUNDING RELIEF FOR PRIVATE SECTOR PENSION PLANS

The opportunity for private sector plans to elect temporary solvency funding relief was first introduced in 2009 and was subsequently amended and extended in 2012, 2016 and 2017. The latest rounds of extension were granted under O. Reg. 161/16 and O. Reg. 225/17; and together, they provide the following relief options:

- Option 6** - Consolidating existing special payments for solvency deficiencies into a new 5-year schedule;
- Option 7** - Extending the period for liquidating a new solvency deficiency from a maximum of 5 years to a maximum of 10 years, subject to consent of the plan members; and
- Option 8** - Deferring up to 24 months for the funding of special payments with respect to any new solvency deficiency.

Based on the latest actuarial valuation reports included in this 2018 Report, 405 plans have elected various combinations of the above solvency funding relief as prescribed under sections 5.6.2 and 5.6.3 of Regulation 909. Of those plans, 275 have transitioned over to the new 2018 funding regime. Of the remaining 130 plans that have not transitioned over to the new 2018 funding regime, six plans have since wound up.

**Table 3.6 – Distribution of 2016/2017 Solvency Relief Options Elected**

Election	Number of Electing Plans	% of Options Elected	# Plans transitioning to new funding	# plans still on Solvency Relief
Option 6 only	75	18%	44	31
Option 7 only	16	4%	10	6
Option 8 only	187	46%	124	63
Option 6 & 7	11	3%	9	2
Option 6 & 8	116	29%	88	28
Total	405	100%	275	130



4.0 TRENDS ANALYSIS

The following trends analysis incorporates data from all filed reports with valuation dates between July 1, 2014 and June 30, 2018 and therefore may include more than one valuation report from any given pension plan.

4.1 SOLVENCY FUNDED STATUS

Table 4.1 shows a breakdown of plans by solvency ratios for the past four valuation periods from 2014 to 2017 (each valuation period begins on July 1st)⁴. The majority of plans have a valuation date of either December 31st or January 1st.

Table 4.1 – Breakdown of Plans (Other than Listed JSPPs) by Solvency Ratios

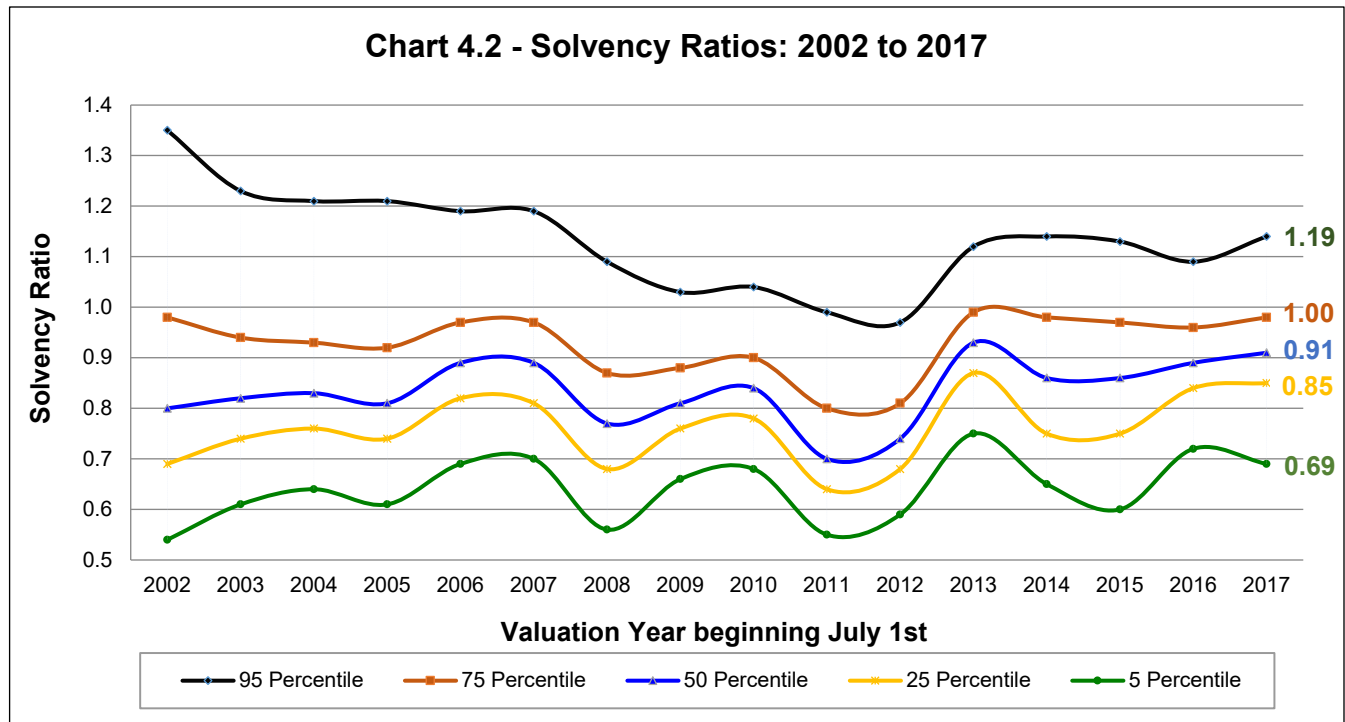
Solvency Ratio (SR)	July 1, 2014 to June 30, 2015		July 1, 2015 to June 30 2016		July 1, 2016 to June 30 2017		July 1, 2017 to June 30, 2018	
	# of Plans	% of Plans	# of Plans	% of Plans	# of Plans	% of Plans	# of Plans	% of Plans
SR < 0.60	10	2.9%	17	4.7%	16	1.6%	27	3.3%
0.60 ≤ SR < 0.80	107	31.0%	110	30.2%	133	13.2%	93	11.2%
0.80 ≤ SR < 0.85	35	10.1%	47	12.9%	140	14.0%	101	12.2%
Sub-Total < 0.85	152	44.0%	174	47.8%	289	28.8%	221	26.7%
0.85 ≤ SR < 0.90	32	9.3%	45	12.4%	242	24.1%	150	18.1%
0.90 ≤ SR < 1.00	65	18.8%	70	19.2%	322	32.1%	282	34.0%
Sub-Total < 1.00	249	72.1%	289	79.4%	853	85.0%	653	78.8%
1.00 ≤ SR < 1.20	73	21.2%	59	16.2%	127	12.6%	145	17.5%
SR ≥ 1.20	23	6.7%	16	4.4%	24	2.4%	31	3.7%
Total	345	100.0%	364	100.0%	1,004	100.0%	829	100.0%
Median Ratio	0.88		0.85		0.89		0.91	

The percentage of plans with a solvency ratio less than 0.85 has decreased from 28.8% during the 2016/2017 valuation period to 26.7% in the 2017/2018 valuation period. The proportion of underfunded plans on a solvency basis (i.e., a solvency ratio less than 1.0) also decreased from 85.0% during the 2016/2017 valuation period to 78.8% in the 2017/2018 valuation period.

⁴ The number of plans for 2014-2017 inclusive may differ from those reported in the 2017 Report due to a variety of reasons including reports filed after last year's cut-off date of Dec. 31, 2017, plans that have been wound up, converted to a DC arrangement, plans that filed a late report or have had their registration moved out of the province. In addition, we have now also included retroactively a large single employer public sector pension plan in our trend analysis.



Chart 4.2 shows the distribution of solvency ratios at different percentiles from 2002 to 2017. Since the 2007 valuation period, the solvency ratios of pension plans have been volatile.





Charts 4.3 and 4.4 compare plans with a solvency excess to those with a solvency deficit for each of the four valuation periods from 2014/2015 to 2017/2018, as well as for the three-year valuation period from July 1, 2015 to June 30, 2018.⁵ Chart 4.3 compares the number of plans and Chart 4.4 compares the amount of solvency excess or deficit. The number of plans with solvency excess has remained well below the number of plans with solvency deficit.

Chart 4.3 - Number of Plans (Other than Listed JSPPs) with Solvency Excess vs. Solvency Deficit

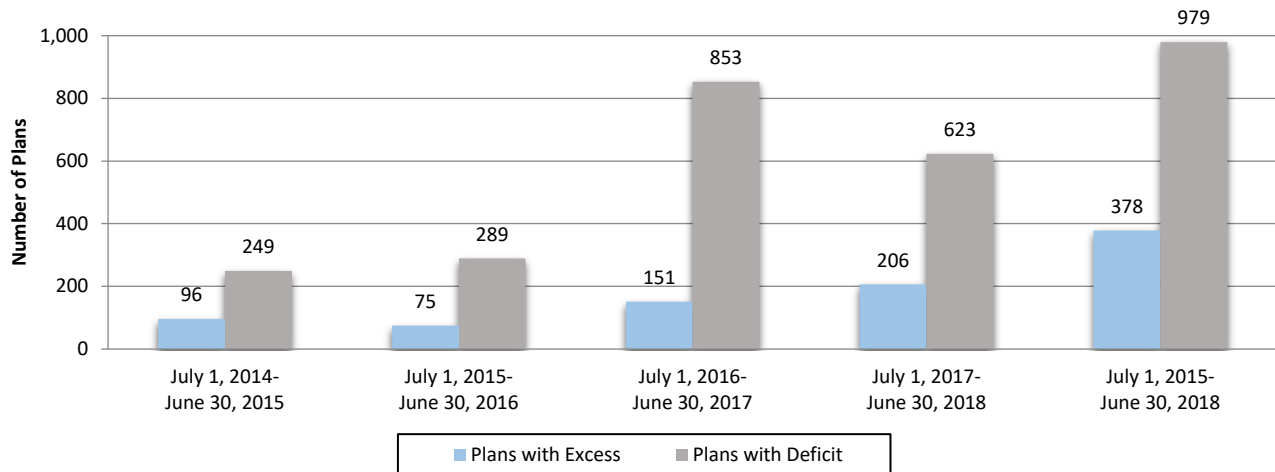
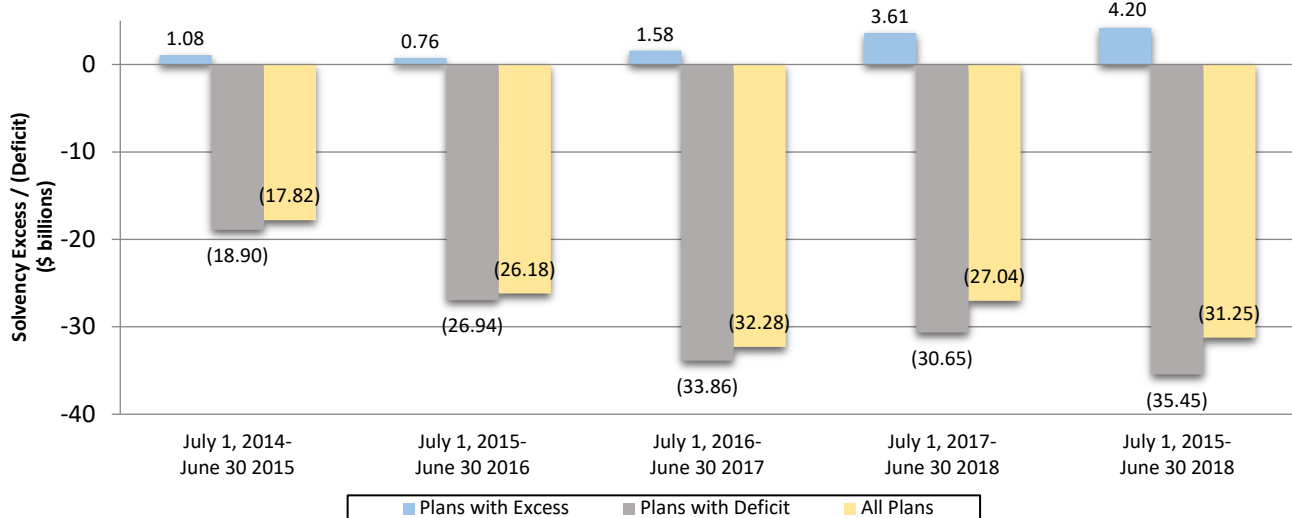


Chart 4.4 - Amount of Solvency Excess/(Deficit)



⁵ Individual valuation periods include those plans that filed a report with a valuation date that fell during that individual period. The July 1, 2015 - June 30, 2018 period includes only the last funding valuation report filed. The total number of plans included in each of the valuation periods is therefore higher than the number of plans included in the combined period.



On a dollar amount basis, the latest filed reports during the July 1, 2015 to June 30, 2018 valuation period revealed a *net* solvency deficit of \$31.2 billion (after allowance for expenses) on solvency liabilities of \$282.3 billion. This represents the total level of under-funding for the 1,357 DB plans analyzed in the 2018 Report, excluding the Listed JSPPs.

Ontario's legislation allows certain benefits (e.g., post-retirement indexation, consent benefits, excluded plant closure and excluded permanent layoff benefits) to be excluded in the determination of solvency liabilities. There were 274 plans that excluded one or more of these benefits, resulting in a reduction of liabilities totaling \$36.5 billion. Thus, the total wind up funding shortfall, after making allowances for expenses, is \$67.7 billion (\$31.2 billion plus \$36.5 billion). This measures the funding shortfall of all the plans in the database if they were to have wound up at their last valuation dates. Of course, this only depicts a hypothetical scenario as the majority of pension plans continue operating on a going-concern basis.

4.2 ACTUARIAL ASSUMPTIONS

Going-Concern Interest Rate

Table 4.5 shows the interest rate assumptions used in the going-concern valuations. The trend to using lower interest rate assumptions appears to have reverted in the July 1, 2017 to June 30, 2018 valuation period although they are still lower than the levels in the July 1, 2014 to June 30, 2015 valuation period in general. For example, 12% of the actuarial valuation reports included in our analysis with valuation dates between July 1, 2017 and June 30, 2018 used an interest rate equal to or greater than 6.00% and 39% used an interest rate equal to or greater than 5.50% (increased from 8% and 25% respectively for those reports with valuation dates between July 1, 2016 and June 30, 2017 included in the 2017 Report).

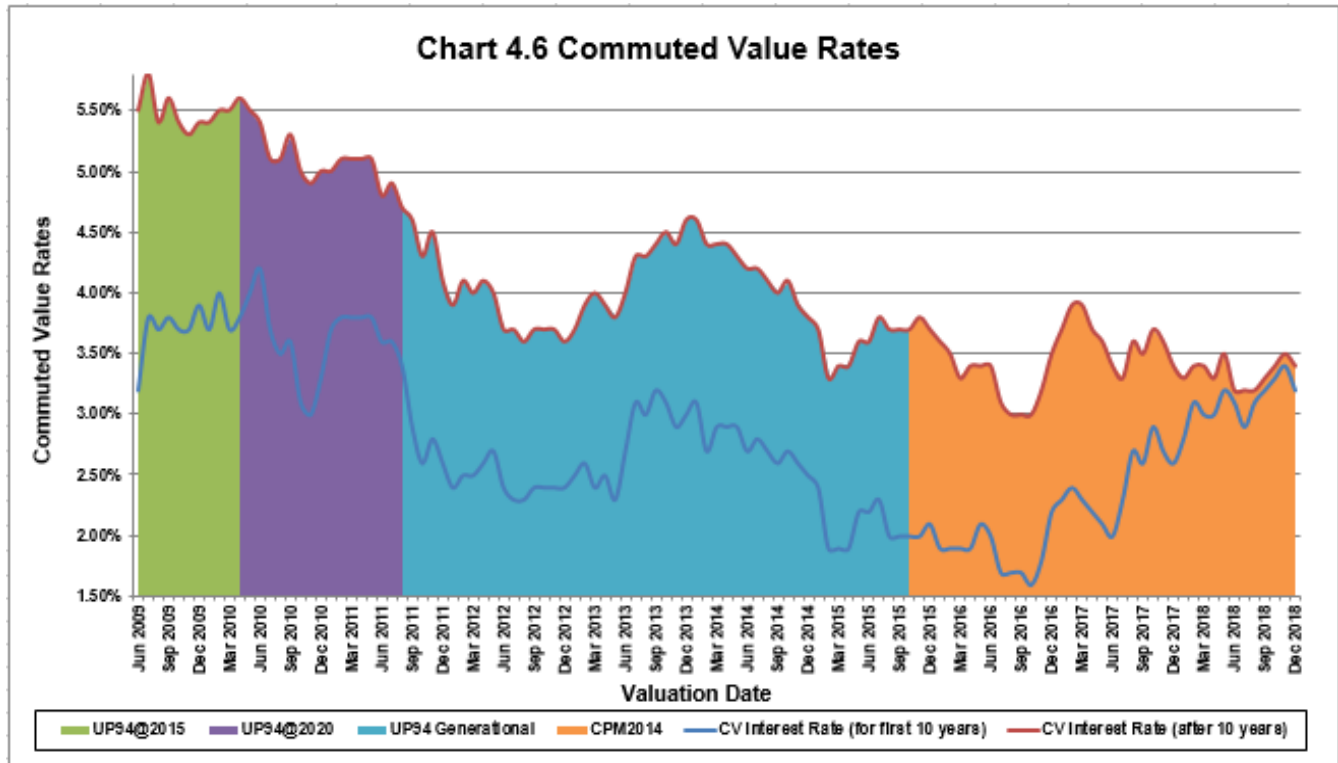
Table 4.5 – Going-Concern Interest Rate Assumption by Valuation Period

Rate (%)	July 1, 2014 to June 30, 2015		July 1, 2015 to June 30, 2016		July 1, 2016 to June 30, 2017		July 1, 2017 to June 30, 2018	
	# of Plans	% of Plans	# of Plans	% of Plans	# of Plans	% of Plans	# of Plans	% of Plans
Rate < 4.00	39	11.1%	53	14.3%	157	15.5%	121	14.5%
4.00 ≤ Rate < 4.50	27	7.7%	35	9.5%	125	12.4%	72	8.6%
4.50 ≤ Rate < 5.00	45	12.8%	49	13.2%	187	18.5%	105	12.6%
5.00 ≤ Rate < 5.50	93	26.5%	115	31.1%	292	28.9%	212	25.4%
5.50 ≤ Rate < 6.00	86	24.5%	74	20.0%	174	17.2%	226	27.1%
6.00 ≤ Rate < 6.50	53	15.1%	40	10.8%	70	6.9%	88	10.5%
Rate ≥ 6.50	8	2.3%	4	1.1%	6	0.6%	11	1.3%
Total	351	100.0%	370	100.0%	1,011	100.0%	835	100.0%
Average (%)	5.06%		4.90%		4.89%		5.02%	



Solvency Interest Rates

Chart 4.6 graphs the non-indexed commuted value and mortality basis over the period shown based on the CIA Standards of Practice for Pension Plans applicable as of the valuation date.

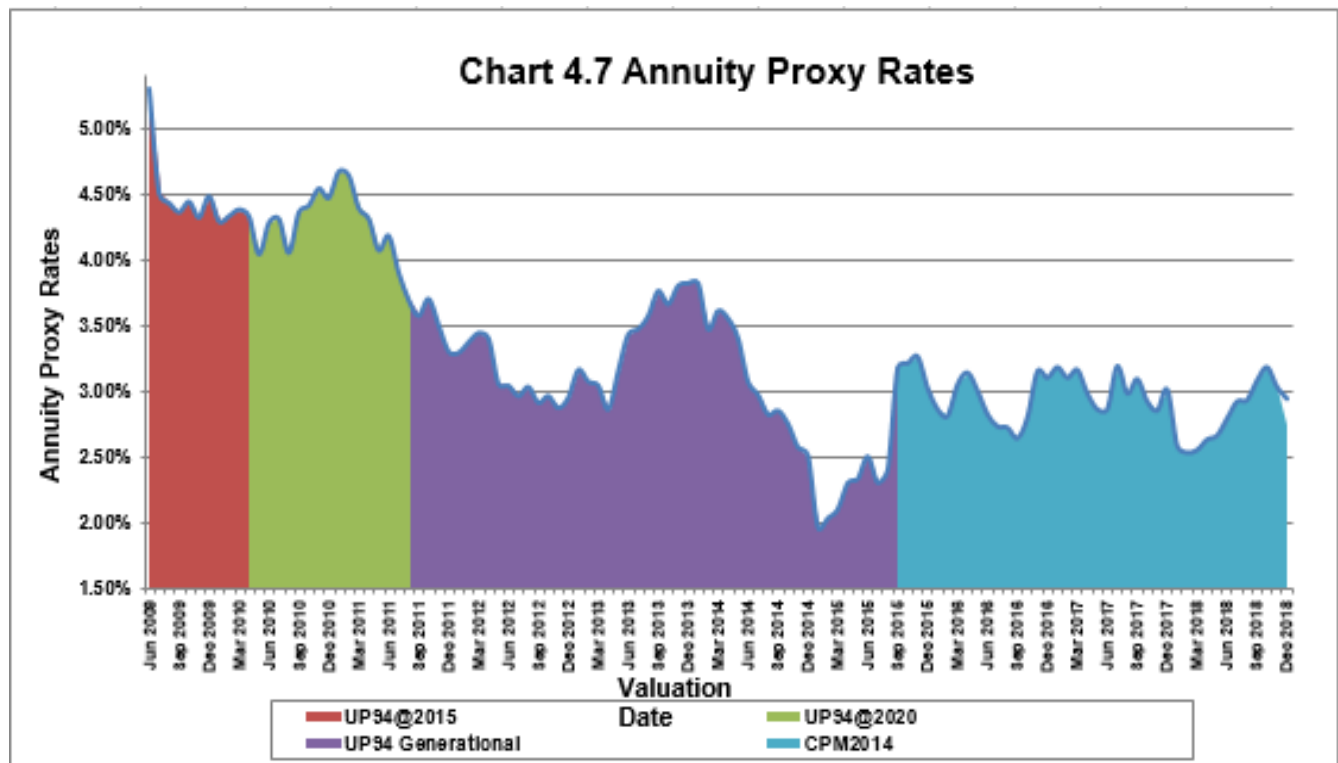


The CIA periodically updates its Guidance to actuaries for estimating the cost of purchasing a group annuity for Hypothetical Wind up and Solvency Valuations. The most recent [Educational Note](#) was issued on March 18, 2019 from the Committee on Pension Plan Financial Reporting. The Guidance concluded that for valuations with effective dates between December 31, 2018 and December 30, 2019, an appropriate discount rate for estimating the cost of purchasing a non-indexed group annuity, prior to any adjustment for sub- or super-standard mortality, would be determined based on the interpolation method, applicable durations and spreads outlined below. The current Guidance indicates that an appropriate spread above unadjusted CANSIM V39062 is as follows:

Illustrative Block	Duration	Spread above unadjusted CANSIM V39062
Low Duration	8.5	100 bps
Medium Duration	11.0	110 bps
High Duration	13.4	110 bps



Chart 4.7 graphs the non-indexed interest rates for annuity purchases since 2009 as set out in the historical CIA Guidance. The chart shows estimated interest rates based on liabilities with a medium duration, where applicable.





5.0 INVESTMENT

The plans included in the investment data analysis are a subset of the 1,364 plans identified in Section 2 of this 2018 Report. This subset consists of plans that have filed an Investment Information Summary (IIS) for the most recent 2018 monitoring cycle (fiscal year-ends between July 1, 2017 and June 30, 2018). There are 1,305 plans included in the investment data analysis, representing 96% of the plans included in the funding data analysis.⁶ This number includes the seven Listed JSPPs. For hybrid plans, only the DB assets are included in the data.

5.1 SUMMARY OF PENSION FUND PROFILES AND PERFORMANCE

The asset mix of the 1,305 plans for the most recent monitoring cycle and their performance are summarized in Table 5.1 and depicted in Chart 5.2, Chart 5.3 and Chart 5.4.

In the Asset Mix section, the weight of each asset class is shown for all plans in each subgroup and for all plans as a whole.

In the Performance section, all performance numbers are determined at the individual plan level. “Average Return” means the average gross rate of return and “Average Investment Fees” means the average expenses paid from the pension plan related to managing the pension plan’s investments, expressed as a percentage of average assets during the reporting year.

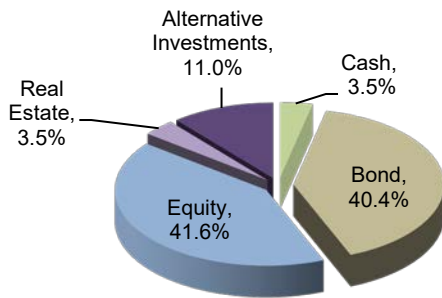
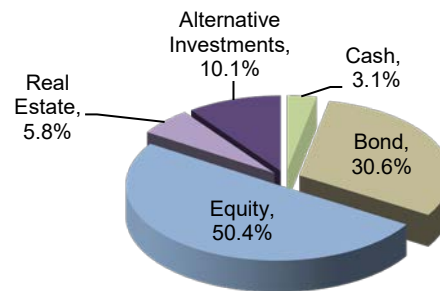
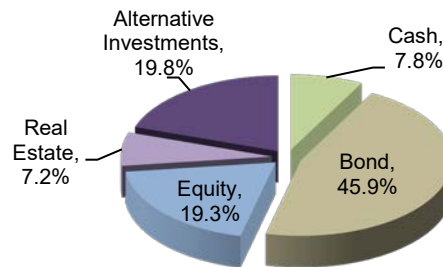
Table 5.1 – Investment Profile of All Plans

Asset Mix	SEPP		MEPP		Listed JSPP	
	Market Value (in Millions)	% of Total Investments	Market Value (in Millions)	% of Total Investments	Market Value (in Millions)	% of Total Investments
Cash	\$7,390	3.5%	\$1,137	3.1%	\$32,422	7.8%
Bond	\$85,785	40.4%	\$11,068	30.6%	\$191,823	45.9%
Equity	\$88,519	41.6%	\$18,195	50.4%	\$80,405	19.3%
Real Estate	\$7,403	3.5%	\$2,091	5.8%	\$29,846	7.2%
Alternative Investments ⁷	\$23,469	11.0%	\$3,642	10.1%	\$82,667	19.8%
Total	\$212,566	100.0%	\$36,133	100.0%	\$417,163	100.0%
Performance						
Average Gross Return ⁸	8.72%		8.48%		10.66%	
Average Investment Fees	0.37%		0.43%		0.38%	

⁶ Plans not included here are primarily plans with outstanding IIS filings.

⁷ Alternative Investments include hedge funds, private equity, infrastructure, currency hedging, resource properties, commodities, etc.

⁸ The average return in this table and other tables in this section are the arithmetic (equally-weighted) average of investment returns of the pension funds in each subgroup. The average of investment returns weighted by the sizes of all 1,305 pension funds is 9.93%, compared to 8.71% on an equally-weighted basis as shown in this table.


Chart 5.2: Asset Allocation SEPPs

Chart 5.3: Asset Allocation of MEPPs

Chart 5.4: Asset Allocation of Listed JSPPs


On a broad basis, traditional fixed income assets (consisting of cash and bonds) constitute 44% of total investments for the SEPPs. Non-fixed income assets (consisting of equity, real estate and alternative investments) constitute 56% of total investments, although we note that the nature of alternative investments means that they cannot always be classified as purely fixed or non-fixed income.

By comparison, the MEPPs and the seven Listed JSPPs (which are mostly large public sector plans) have a very different aggregate asset mix. The MEPPs have a much lower allocation to traditional fixed income assets and the Listed JSPPs exhibit a higher percentage of alternative investments and lower proportion of equity investments.

Table 5.5 – Performance Result Percentiles by Plan Type

Plan Type	SEPP	MEPP	Listed JSP	All Plans
Gross Investment Returns				
90 th Percentile	11.51%	10.39%	12.72%	11.49%
75 th Percentile	10.10%	9.56%	10.44%	10.06%
Median	8.68%	8.71%	9.95%	8.71%
25 th Percentile	7.15%	7.65%	9.65%	7.20%
10 th Percentile	5.58%	6.09%	9.28%	5.61%
Investment Fees				
90 th Percentile	0.74%	0.94%	0.89%	0.74%
75 th Percentile	0.52%	0.63%	0.51%	0.53%
Median	0.35%	0.39%	0.25%	0.35%
25 th Percentile	0.13%	0.11%	0.12%	0.13%
10 th Percentile	0.00%	0.00%	0.06%	0.00%

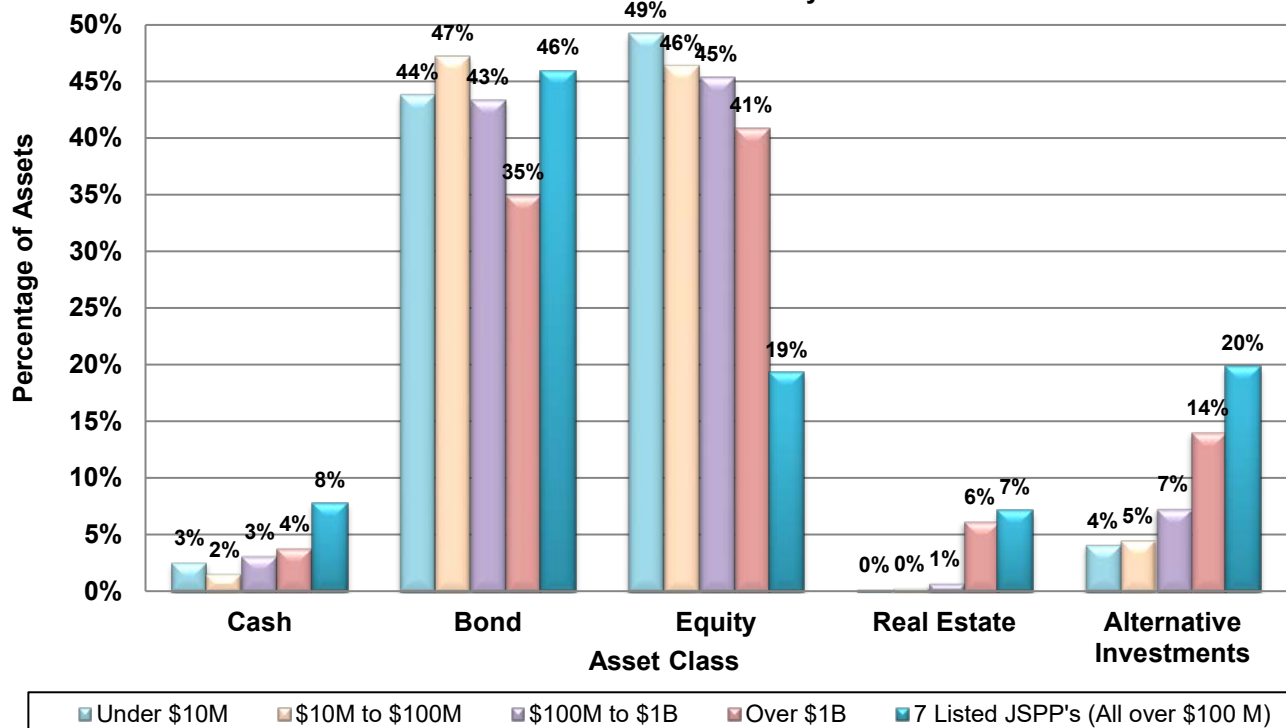


Allocations to various asset classes vary among pension plans, based on the total value of their assets. The larger the pension fund, the more assets are allocated in real estate and alternative investments and the less in bond and equity. Notably, pension funds with over \$1 billion in assets invest, on average, 25.3% in real estate and alternative investments (combined) – this compares to 7.4% for those with less than \$1 billion in assets. The asset allocation of all plans, and performance, by asset size is shown in Table 5.6 and depicted in Chart 5.7.

Table 5.6 – Asset Allocation of All Plans by Asset Size

Size of Plan Assets	Under \$10M	\$10M to \$100M	\$100M to \$1B	Over \$1B	Listed JSPP	All Plans
# of Plans	400	587	268	43	7	1,305
Cash	2.6%	1.6%	3.2%	3.9%	7.8%	3.4%
Bond	43.9%	47.2%	43.3%	34.9%	45.9%	40.9%
Equity	49.2%	46.3%	45.3%	40.9%	19.3%	42.8%
Real Estate	0.2%	0.3%	0.8%	6.2%	7.2%	2.2%
Alternative Investments	4.1%	4.6%	7.4%	14.1%	19.8%	10.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Performance						
Average Gross Return	8.28%	8.71%	9.19%	9.41%	10.66%	8.71%
Average Investment Fees	0.50%	0.33%	0.28%	0.33%	0.38%	0.37%

Chart 5.7 - Asset Allocation of All Plans by Asset Size





Investment data reported in FSCO's previous annual reports on the funding and investment of DB pension plans in Ontario from 2009 to 2018 monitoring cycles (each starting at July 1st the previous year) demonstrates a general decreasing trend in pension fund asset allocation in equity and a general increasing trend in in alternative investments. The asset allocation of all plans (other than the Listed JSPPs) over this period is shown in Table 5.8 and depicted in Chart 5.9.

Table 5.8 – Asset Allocation of All Plans (Other than Listed JSPPs) from 2009 to 2018

Asset Class	% of Total Investments									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cash	4.6%	6.1%	3.1%	3.1%	3.1%	2.7%	2.9%	3.3%	3.7%	3.4%
Bond	41.0%	36.5%	38.4%	42.3%	40.4%	39.4%	41.8%	42.4%	41.1%	38.9%
Equity	51.3%	54.1%	53.9%	49.1%	50.8%	52.0%	48.0%	45.3%	44.7%	43.0%
Real Estate	1.3%	1.2%	1.2%	1.5%	1.5%	1.5%	1.7%	1.8%	2.1%	3.8%
Alternative Investments	1.8%	2.1%	3.4%	4.0%	4.2%	4.4%	5.6%	7.2%	8.4%	10.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chart 5.9 - Asset Allocation of All Plans from 2009 to 2018

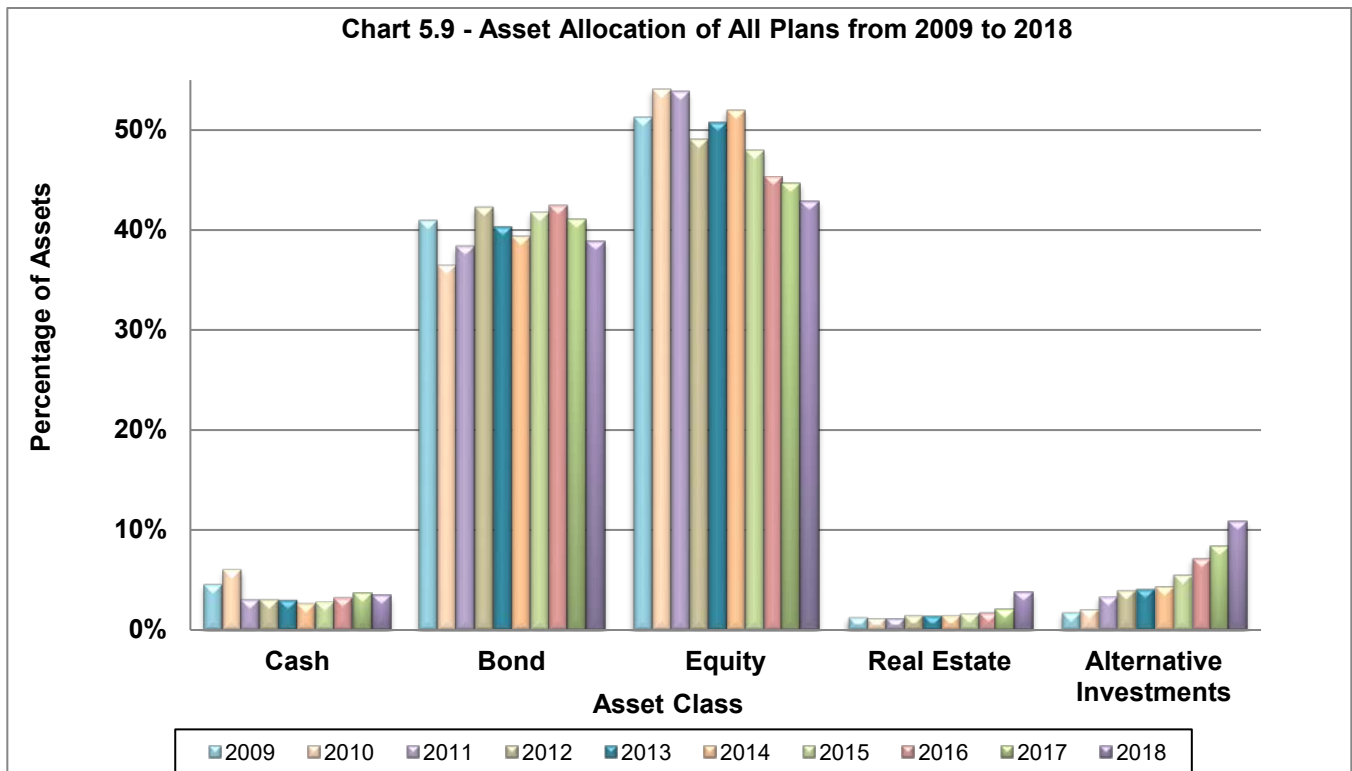
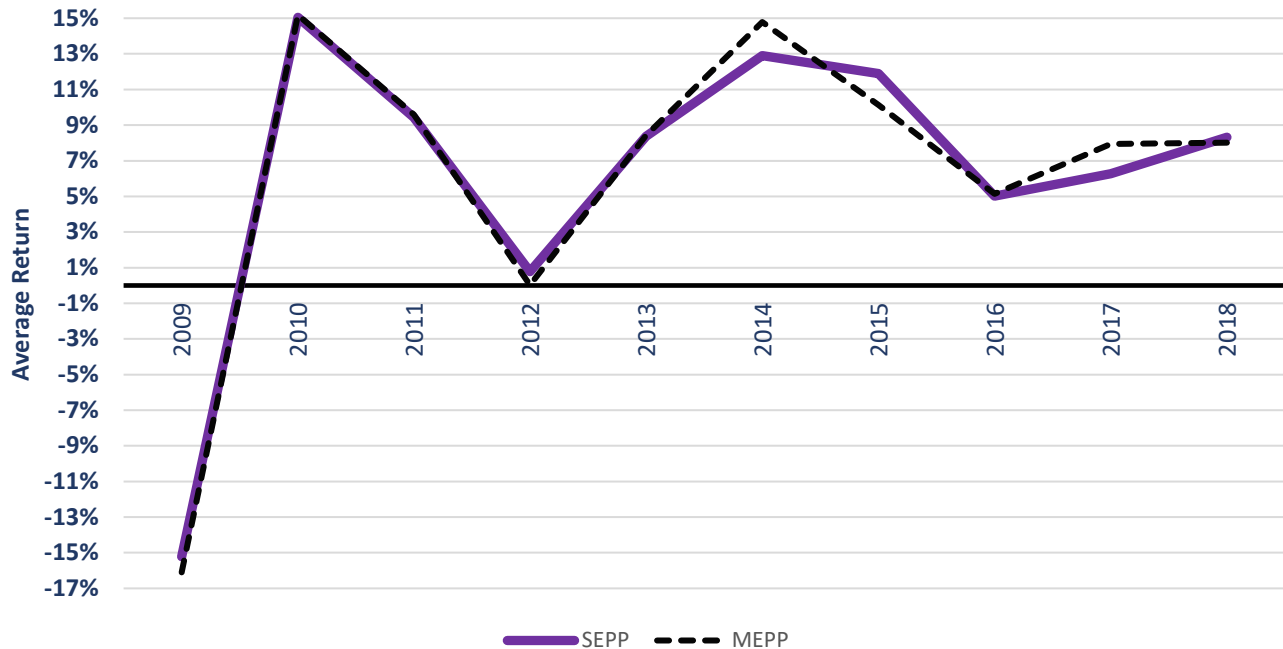




Chart 5.10 - Investment Returns (Net of Investment Fees) SEPP and MEPP (2009-2018)



5.2 ADDITIONAL INFORMATION

This section provides additional fund performance information, for plans other than Listed JSPPs, based on plan's solvency ratio and percentage of funds invested in pooled funds.

By Solvency Ratio (for plans other than Listed JSPPs)

Table 5.11 – Investment Results by Solvency Ratio (SR)

Solvency Ratio (SR)		SR < 0.85	0.85 ≤ SR < 1	SR ≥ 1.0	All Plans
# of Plans		259	700	339	1,298
Asset Mix	Fixed Income (Cash and Bond)	33.5%	44.3%	46.2%	42.4%
	Equity	51.3%	40.7%	40.1%	42.9%
	Real Estate	3.7%	4.7%	2.1%	3.8%
	Alternative Investments	11.5%	10.3%	11.6%	10.9%
Total					
Performance	Average Gross Return	8.65%	8.77%	8.61%	8.71%
	Average Investment Fees	0.41%	0.37%	0.35%	0.37%

It appears that better funded plans tend to have higher allocation to fixed income – this could perhaps be attributed to any de-risking strategies that these plans might have implemented.



By Percentages Invested in Pooled Funds (for plans other than Listed JSPPs)

Table 5.12 – Investment Results by Percentage Invested in Pooled Funds

Plan Size					
% Invested in Pooled Funds		Under \$10M	\$10M to \$100M	\$100M to \$1B	Over \$1B
<20%	# of plans	16	52	47	12
	Average Gross Return	8.18%	7.59%	8.40%	10.05%
	Average Investment Fees	0.44%	0.29%	0.28%	0.23%
20% - 80%	# of plans	21	64	84	26
	Average Gross Return	10.18%	8.52%	9.27%	9.12%
	Average Investment Fees	0.30%	0.25%	0.29%	0.39%
>80%	# of plans	363	471	137	5
	Average Gross Return	8.17%	8.86%	9.40%	9.39%
	Average Investment Fees	0.52%	0.35%	0.27%	0.25%
Total	# of plans	400	587	268	43
	Average Gross Return	8.28%	8.71%	9.19%	9.41%
	Average Investment Fees	0.50%	0.33%	0.28%	0.33%

Allocation to pooled funds decreases with size of the plan. There appears to be a positive relationship between the percentage of assets invested in pooled funds and gross returns for the mid-size plans and the reverse is observed for plans with over \$1 billion in assets.



6.0 BASELINE PROJECTIONS

This section estimates annual funding contributions and funded positions of all plans to December 31, 2018 to facilitate continued monitoring and trend analysis.

6.1 ESTIMATED DB FUNDING CONTRIBUTIONS IN 2019

Table 6.1 presents 2019 estimated funding contributions – comprising normal costs and special payments – for DB plans including hybrid plans with defined benefit provisions. Estimates are based on contribution recommendations set out in most recently filed plan valuation reports between July 1, 2015 and June 30, 2018.⁹

Table 6.1 – Estimated DB Funding in 2019

	SEPP		MEPP	Listed JSPP	All Plans
	Plans with Solvency Excess	Plans with Solvency Deficit			
Number of Plans	369	915	73	7	1,364
	(in Millions)				
Employer Normal Cost Contributions	\$764	\$2,169	\$1,103	\$5,283	\$9,319
Member Required Contributions	\$233	\$899	\$143	\$4,985	\$6,260
Sub-total	\$997	\$3,068	\$1,246	\$10,268	\$15,579
Special Payments	\$21	\$1,173	\$68	\$744	\$2,006
Total	\$1,018	\$4,241	\$1,314	\$11,012	\$17,585

Total 2019 DB funding contributions are estimated to be \$17.6 billion of which 11.4% represents special payments of \$2.0 billion.

For plans other than MEPPs and Listed JSPPs, the table also provides a breakdown of estimated funding contributions between plans with a solvency excess and plans with a solvency deficit in the most recently filed report. Special payments of \$21 million represent 2.1% of total contributions for SEPPs with a solvency excess. This compares with special payments of \$1,173 million, representing about 27.7% of total contributions for SEPPs with solvency deficits.

Estimated 2019 funding contributions are determined after consideration of prior year credit balances or funding excesses, subject to statutory restrictions.

⁹ For plans where the AIS reported contributions did not extend to cover 2019, the 2019 estimated contributions were determined assuming contributions would continue at the last available rate.



6.2 PROJECTED FINANCIAL POSITION AS AT DECEMBER 31, 2018

December 31, 2018 Solvency Position Projection

Table 6.2 presents the distribution of solvency ratios reported in last filed valuation reports and the distribution of projected solvency ratios (PSRs) derived by projecting DB solvency plan assets and actuarial liabilities to the end of 2018 (with a comparison of PSRs as at December 31, 2017 included in the 2017 Report). The projections reflect the impact of investment returns, changes in solvency interest rates and expected funding contributions.

Table 6.2 – Distribution of Solvency Ratios

	Actual as at Last Filed Valuation	Projected Solvency Ratio as at Dec 31, 2018		
		SEPP	MEPP	All Plans
Median SR	94%	94%	75%	94%
SR < 70%	3%	1%	43%	3%
70% ≤ SR < 85%	14%	15%	30%	16%
85% ≤ SR < 100%	56%	56%	17%	54%
100% ≤ SR	27%	28%	10%	27%

The median projected solvency ratio has decreased to 94% as at December 31, 2018 from 96% as at December 31, 2017. The reduction is primarily attributable to:

- A 5% decrease due to an estimated median net investment return of -2.8% for 2018; partially offset by
- A 3% increase due to an increase in the solvency valuation interest rates as at December 31, 2018 from their December 31, 2017 levels as well as estimated contributions made in 2018.

December 31, 2018 Going-Concern Position Projection

With the enhanced focus on going-concern funded positions of DB plans under the new funding regime, FSCO also estimated going-concern funded ratios as at December 31, 2018 to facilitate further proactive tracking in the future. December 31, 2018 going-concern funding ratios were developed by projecting DB going-concern plan assets and actuarial liabilities to the end of 2018 and reflecting actual/estimated investment returns to the end of 2018.

Table 6.3 – Distribution of Going-concern (GC) Ratios

	Actual as at Last Filed Valuation	Projected GC Ratio as at Dec 31, 2018			
		SEPP	MEPP	Listed JSPP	All Plans
Median GC Ratio	111%	105%	99%	101%	105%
GC Ratio < 70%	1%	1%	0%	0%	1%
70% ≤ GC Ratio < 85%	3%	5%	6%	0%	5%
85% ≤ GC Ratio < 100%	16%	30%	48%	47%	31%
100% ≤ GC Ratio	80%	64%	46%	53%	63%

It should be noted that the going-concern ratios are determined as defined in Regulation 909 and do not include any PfAD.



Methodology and Assumptions

Results reported in the most recently filed valuation reports (i.e., assets and liabilities) were projected to December 31, 2018 reflecting estimated investment returns and expected contributions along with the following assumptions:

- Sponsors would use all available funding excess and prior year credit balances for contribution holidays subject to statutory restrictions;
- Sponsors would make all required normal cost contributions and minimum statutory special payments; and
- Cash outflows equal to pension amounts payable to retired members as reported in last filed valuation reports were deducted from both plan assets and liabilities. Plan administration costs were indirectly reflected through the use of net after expense investment returns.

As in the 2017 Report, each plan's unique projection period investment returns for 2015, 2016 and 2017 were determined based on its IIS filings.

Table 6.4 – Individual Plan 2015, 2016 and 2017 Rate of Return Statistics

	5 th Percentile	1st Quartile	2nd Quartile	3rd Quartile	95 th Percentile
2017 Gross Return	12.6%	10.0%	8.9%	7.7%	5.0%
2017 Net After Investment Expense	12.2%	9.6%	8.5%	7.2%	4.7%
2017 Net After All Expense	11.6%	9.2%	7.9%	6.7%	3.8%
2016 Gross Return	11.6%	8.1%	6.4%	4.7%	2.2%
2016 Net After Investment 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%
2015 Gross Return	10.0%	7.0%	5.5%	4.1%	1.4%
2015 Net After Investment Expense	9.6%	6.6%	5.1%	3.7%	0.9%
2015 Net After All Expense	9.3%	6.2%	4.7%	3.1%	-0.3%

For 2018, each plan's returns were estimated based on its 2017 IIS asset allocation information in conjunction with 2018 market index returns, offset by a 25 basis point quarterly expense allowance.

Table 6.5 – Estimated Rate of Return Statistics for 2018 based on Market Index Returns

	5 th Percentile	1st Quartile	2nd Quartile	3rd Quartile	95 th Percentile
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%



Table 6.6 – 2018 Market Index Returns

	S&P / TSX Total Return Index	MSCI World Total Net Return Index	FTSE TMX Universe Bond Index	FTSE TMX Long Bond Index
Q4 2018	-10.1%	-8.5%	1.8%	1.9%
Q3 2018	-0.6%	3.2%	-1.0%	-2.4%
Q2 2018	6.8%	3.8%	0.5%	0.9%
Q1 2018	-4.5%	1.6%	0.1%	-0.0%

Table 6.7 – Projected Solvency Valuation Bases at December 31, 2017 and 2018:

	Commuted Value Basis	Annuity Purchase Basis
December 31, 2018	Interest: 3.20% for 10 years, 3.40% thereafter Mortality: CPM2014 generational	Interest: 3.23% Mortality: CPM2014 generational
December 31, 2017	Interest: 2.60% for 10 years, 3.40% thereafter Mortality: CPM2014 generational	Interest: 3.02% Mortality: CPM2014 generational



7.0 GLOSSARY

The following terms are explained for the purpose of this report:

Defined Benefit (DB) Pension Plan: In a defined benefit pension plan, the amount of the pension benefit is determined by a defined formula, usually based on years of service. There are several types of defined benefit plans, including:

- **Final Average** – the benefit is based on the member's average earnings over the member's last several years (typically three or five) of employment and years of service.
- **Career Average** – the benefit is based on the member's earnings over the member's entire period of service.
- **Flat Benefit** – the benefit is based on a fixed dollar amount for each year of service.

Defined Contribution (DC) Pension Plan: In a defined contribution plan, the pension benefit is based solely on the amount of pension that can be provided by the amount contributed to the member's individual account together with any expenses and investment returns allocated to that account.

Frozen DB Plans: Pension plans in which members have a frozen defined benefit entitlement and do not accrue any future service in that pension plan.

Frozen Hybrid: Pension plans in which members have a frozen defined benefit entitlement, but are accruing future defined contribution benefits.

Funding Valuation: This is a valuation of a defined benefit pension plan prepared for funding purposes. Two types of valuations are required by the PBA: a *going-concern* valuation (which assumes the pension plan will continue indefinitely); and a *solvency* valuation (which assumes the plan would be fully wound up as at the effective date of the valuation). Under Ontario's legislation, a solvency valuation may exclude the value of specified benefits (e.g., indexation, prospective benefit increases, or plant closure/layoff benefits).

Hybrid Pension Plan: A hybrid pension plan contains both defined benefit and defined contribution provisions. A member's pension benefit may be a combination of the defined benefit plus the defined contribution entitlement or a pension benefit which is the greater of the defined benefit entitlement or the defined contribution entitlement.

Jointly sponsored pension plan (JSPP): A jointly sponsored pension plan is a special type of pension plan in which decision making and contributions are shared by both plan members and their employer(s). A JSPP provides defined benefits to plan members and contributions are always made by both plan members and their employers (this is known as a contributory plan).

Multi-Employer Pension Plan (MEPP): A multi-employer pension plan covers the employees of two or more unrelated employers. These plans may provide defined benefits but, in most MEPPs, the required contributions are negotiated and fixed through collective bargaining.



Single Employer Pension Plan (SEPP): A single employer pension plan is one in which a single employer, or several related employers within a corporate group, participate and contribute to the same pension plan. A SEPP can be provided to all employees, or just certain classes of employees (e.g., all unionized employees). It is usually governed and administered by the plan sponsor without input from plan members.



8.0 APPENDIX – ADDITIONAL INFORMATION

This appendix provides additional details of the profile of the plans that have been included in the funding data analysis. The data consists of DB pension plans that have filed valuation reports with valuation dates between July 1, 2015 and June 30, 2018. Please refer to **Section 2.0 – Funding Data** for details of how the data was compiled.

Table 8.1 shows a reconciliation of the 1,378 plans analyzed in the 2017 Report to the 1,364 plans analyzed in the 2018 Report and Table 8.2 compares the number of plans analyzed in the current report with the plans analyzed in previous reports.

Table 8.1 – Reconciliation of Plans from the 2017 Report to the 2018 Report

Plan Type	Final Average	Career Average	Flat Benefit	Hybrid	Frozen DB & Hybrid	MEPP	Listed JSPP	TOTAL
2017 Report	356	95	162	385	306	74	0	1,378
New plans / Spin-offs			2	4				6
Previously excluded	1			5			6	12
Change in Benefit Type								
• Final Average	(1)						1	
• Career Average								
• Flat Benefit	1		(1)					
• Hybrid	1			(1)				
Outstanding report*	(3)							(3)
Data Correction(s)		1		1		(1)		1
Wind up / Mergers	(1)	(2)	(6)	(10)	(11)			(30)
2018 Report	354	94	157	384	295	73	7	1,364

* These are plans that were not included in last year's analysis because they did not file a funding valuation report with a valuation date between July 1, 2014 and June 30, 2017. They have since filed a funding valuation report with a valuation date between July 1, 2015 and June 30, 2018

Table 8.2 – Plans Included in Current and Previous Reports by Plan/Benefit Type

Year	Final Average	Career Average	Flat Benefit	Hybrid	Frozen DB & Hybrid	MEPP	Listed JSPP	Total	Total Membership
2018	354	94	157	384	295	73	7	1,364	3,377,627
2017	356	95	162	385	306	74	0	1,378	1,870,615
2016	352	94	166	384	264	73	0	1,333	1,866,565
2015	366	104	174	397	170	72	0	1,283	1,835,156
2014	384	112	188	386	168	73	0	1,311	1,833,773
2013	425	132	202	391	135	76	0	1,361	1,860,156
2012	455	140	216	387	113	76	0	1,387	1,832,800
2011	491	152	234	381	110	70	0	1,438	1,828,604
2010	548	172	262	371	83	70	0	1,506	1,866,444
2009	640	197	322	310	n/a	70	0	1,539	1,899,155
2008	619	220	338	315	n/a	72	0	1,564	1,867,653
2007	663	236	362	292	n/a	79	0	1,632	1,880,563
2006	730	271	394	224	n/a	79	0	1,698	1,863,433
2005	805	293	424	127	n/a	73	0	1,722	1,801,895
2004	839	292	422	86	n/a	79	0	1,718	1,765,255



Table 8.3 shows a breakdown of the number of plans by size of plan membership.

Table 8.3 – Number of Plans by Size of Membership in Plan

Number of Members in Plan	SEPP	MEPP	Listed JSPP	Total
0-49	280	0	0	280
50-99	188	2	0	190
100-249	293	3	0	296
250-499	192	3	0	195
500-999	141	12	1	154
1,000-4,999	149	26	0	175
5,000-9,999	30	11	0	41
10,000 +	11	16	6	33
Total	1,284	73	7	1,364

Table 8.4 shows a breakdown of the total members covered by size of plan membership.

Table 8.4 – Total Membership by Size of Membership in Plan

Number of Members in Plan	SEPP	MEPP	Listed JSPP	Total
0-49	6,837	0	0	6,837
50-99	13,933	171	0	14,104
100-249	47,288	563	0	47,851
250-499	67,054	1,130	0	68,184
500-999	98,149	8,803	569	107,521
1,000-4,999	314,173	62,538	0	376,711
5,000-9,999	217,224	82,556	0	299,780
10,000 +	272,207	811,876	1,372,556	2,456,639
Total	1,036,865	967,637	1,373,125	3,377,627



Table 8.5 – Non-Indexed Commuted Value Rates (CIA Basis)

Year 2018												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select 10 Years	2.80%	3.10%	3.00%	3.00%	3.20%	3.10%	2.90%	3.10%	3.20%	3.30%	3.40%	3.20%
Ultimate 10 Years	3.30%	3.40%	3.40%	3.30%	3.50%	3.20%	3.20%	3.20%	3.30%	3.40%	3.50%	3.40%
Year 2017												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select 10 Years	2.30%	2.40%	2.30%	2.20%	2.10%	2.00%	2.30%	2.70%	2.60%	2.90%	2.70%	2.60%
Ultimate 10 Years	3.70%	3.90%	3.90%	3.70%	3.60%	3.40%	3.30%	3.60%	3.50%	3.70%	3.60%	3.40%
Year 2016												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select 10 Years	1.90%	1.90%	1.90%	1.90%	2.10%	2.00%	1.70%	1.70%	1.70%	1.60%	1.80%	2.20%
Ultimate 10 Years	3.60%	3.50%	3.30%	3.40%	3.40%	3.40%	3.10%	3.00%	3.00%	3.00%	3.20%	3.50%
Year 2015												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select 10 Years	2.40%	1.90%	1.90%	1.90%	2.20%	2.20%	2.30%	2.00%	2.00%	2.00%	2.00%	2.10%
Ultimate 10 Years	3.70%	3.30%	3.40%	3.40%	3.60%	3.60%	3.80%	3.70%	3.70%	3.70%	3.80%	3.70%
Year 2014												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select 10 Years	3.10%	2.70%	2.90%	2.90%	2.90%	2.70%	2.80%	2.70%	2.60%	2.70%	2.60%	2.50%
Ultimate 10 Years	4.60%	4.40%	4.40%	4.40%	4.30%	4.20%	4.20%	4.10%	4.00%	4.10%	3.90%	3.80%
Year 2013												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select 10 Years	2.50%	2.60%	2.40%	2.50%	2.30%	2.70%	3.10%	3.00%	3.20%	3.10%	2.90%	3.00%
Ultimate 10 Years	3.70%	3.90%	4.00%	3.90%	3.80%	4.00%	4.30%	4.30%	4.40%	4.50%	4.40%	4.60%
Year 2012												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select 10 Years	2.40%	2.50%	2.50%	2.60%	2.70%	2.40%	2.30%	2.30%	2.40%	2.40%	2.40%	2.40%
Ultimate 10 Years	3.90%	4.10%	4.00%	4.10%	4.00%	3.70%	3.70%	3.60%	3.70%	3.70%	3.70%	3.60%
Year 2011												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select 10 Years	3.70%	3.80%	3.80%	3.80%	3.80%	3.60%	3.60%	3.40%	2.90%	2.60%	2.80%	2.60%
Ultimate 10 Years	5.00%	5.10%	5.10%	5.10%	5.10%	4.80%	4.90%	4.70%	4.60%	4.30%	4.50%	4.10%
Year 2010												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select 10 Years	3.70%	4.00%	3.70%	3.80%	4.00%	4.20%	3.70%	3.50%	3.60%	3.10%	3.00%	3.30%
Ultimate 10 Years	5.40%	5.50%	5.50%	5.60%	5.50%	5.40%	5.10%	5.10%	5.30%	5.00%	4.90%	5.00%



Table 8.6 – Non-Indexed Annuity Proxy Rates (CIA Basis)

Year 2018												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low Duration	2.99%	2.91%	2.77%	2.59%	2.77%	2.97%	3.30%	3.09%	3.20%	3.04%	2.96%	2.92%
Medium Duration	3.19%	3.11%	3.17%	2.99%	2.87%	2.87%	3.20%	2.99%	3.10%	2.93%	1.86%	3.02%
High Duration	2.91%	2.99%	2.91%	2.77%	2.59%	2.77%	2.97%	3.30%	3.09%	3.20%	3.04%	2.96%
Year 2017												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low Duration	2.99%	2.91%	2.77%	2.59%	2.77%	2.97%	3.30%	3.09%	3.20%	3.04%	2.96%	2.92%
Medium Duration	3.19%	3.11%	3.17%	2.99%	2.87%	2.87%	3.20%	2.99%	3.10%	2.93%	1.86%	3.02%
High Duration	2.91%	2.99%	2.91%	2.77%	2.59%	2.77%	2.97%	3.30%	3.09%	3.20%	3.04%	2.96%
Year 2016												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low Duration	2.47%	2.42%	2.76%	2.85%	2.71%	2.53%	2.44%	2.43%	2.35%	2.51%	2.86%	2.91%
Medium Duration	2.87%	2.82%	3.06%	3.15%	3.01%	2.83%	2.74%	2.73%	2.65%	2.81%	3.16%	3.11%
High Duration	2.63%	2.47%	2.42%	2.76%	2.85%	2.71%	2.53%	2.44%	2.43%	2.35%	2.51%	2.86%
Year 2015												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low Duration	1.67%	1.74%	1.81%	2.01%	2.04%	2.01%	1.81%	1.91%	2.89%	2.98%	2.97%	2.63%
Medium Duration	1.97%	2.04%	2.11%	2.31%	2.34%	2.51%	2.31%	2.41%	3.19%	3.22%	3.27%	3.03%
High Duration	1.67%	1.67%	1.74%	1.81%	2.01%	2.04%	2.01%	1.81%	1.91%	2.89%	2.98%	2.97%
Year 2014												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low Duration	3.61%	3.63%	3.28%	3.32%	3.26%	3.11%	2.68%	2.58%	2.43%	2.56%	2.46%	2.28%
Medium Duration	3.83%	3.48%	3.62%	3.56%	3.41%	3.08%	2.98%	2.83%	2.86%	2.76%	2.58%	2.52%
High Duration	3.63%	3.63%	3.28%	3.32%	3.26%	3.11%	2.68%	2.58%	2.43%	2.56%	2.46%	2.28%
Year 2013												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low Duration	3.17%	3.08%	3.05%	2.87%	3.16%	2.87%	3.16%	3.24%	3.28%	3.38%	3.57%	3.47%
Medium Duration	3.17%	3.08%	3.05%	2.87%	3.16%	3.44%	3.48%	3.58%	3.77%	3.67%	3.81%	3.83%
High Duration	3.17%	3.08%	3.05%	2.87%	3.16%	3.54%	3.58%	3.68%	3.87%	3.77%	3.91%	3.93%
Year 2012												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low Duration	3.30%	3.38%	3.45%	3.41%	3.06%	3.05%	2.97%	3.04%	2.92%	2.97%	2.88%	2.96%
Medium Duration	3.30%	3.38%	3.45%	3.41%	3.06%	3.05%	2.97%	3.04%	2.92%	2.97%	2.88%	2.96%
High Duration	3.30%	3.38%	3.45%	3.41%	3.06%	3.05%	2.97%	3.04%	2.92%	2.97%	2.88%	2.96%
Year 2011												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low Duration	4.68%	4.65%	4.40%	4.32%	4.08%	4.19%	3.91%	3.70%	3.58%	3.71%	3.51%	3.31%
Medium Duration	4.68%	4.65%	4.40%	4.32%	4.08%	4.19%	3.91%	3.70%	3.58%	3.71%	3.51%	3.31%
High Duration	4.68%	4.65%	4.40%	4.32%	4.08%	4.19%	3.91%	3.70%	3.58%	3.71%	3.51%	3.31%
Year 2010												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low Duration	4.30%	4.34%	4.39%	4.34%	4.05%	4.29%	4.32%	4.06%	4.37%	4.42%	4.55%	4.48%
Medium Duration	4.30%	4.34%	4.39%	4.34%	4.05%	4.29%	4.32%	4.06%	4.37%	4.42%	4.55%	4.48%
High Duration	4.30%	4.34%	4.39%	4.34%	4.05%	4.29%	4.32%	4.06%	4.37%	4.42%	4.55%	4.48%