

Financial Services
Commission
of Ontario



Commission des
services financiers
de l'Ontario

2016 Report on the Funding of Defined Benefit Pension Plans in Ontario

**Overview and Selected Findings
2013-2016**

Financial Services Commission of Ontario

April 2017



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1.0 INTRODUCTION

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, as amended (Regulation).

This report provides pension stakeholders up-to-date funding, investment and actuarial information related to defined benefit (DB) pension plans in Ontario. The information is presented on an aggregate basis for pension plans included in the study, and there is no disclosure of plan-specific information. Except for the trends analysis in Section 4, the report is based on the latest filed valuation reports for DB pension plans with valuation dates between July 1, 2013 and June 30, 2016 and financial statements with fiscal year-end dates between July 1, 2015 and June 30, 2016. The trends analysis uses data drawn from reports filed for DB pension plans with valuation dates between July 1, 2012 and June 30, 2016.

1.1 RISK-BASED MONITORING

FSCO began its risk-based approach to monitoring DB pension plan funding and investment by collecting key actuarial and financial data through the Actuarial Information Summary (AIS).¹ To broaden this approach, FSCO later began collecting financial and investment data through the Investment Information Summary (IIS)². This information is used to create a database and a selective risk-based review system is used to identify individual reports for compliance reviews.

To implement a more comprehensive and integrated approach to assess pension plan risks, FSCO initiated the enhanced Risk-Based Regulation (RBR) Project. In the first phase of the project, FSCO developed an RBR framework to apply consistent principles to the development of FSCO's pension regulatory processes and activities. The framework was finalized in the fall of 2011.

As part of the framework, FSCO identified five broad risk categories to focus on: Funding, Investment, Administration, Governance, and Sponsor/Industry. Within each category, FSCO identifies certain risk indicators/factors in a system-based Risk Indicator Tool (RIT). This helps prioritize which plans should be selected for a more detailed risk assessment through a Tier 1 or Tier 2 review.

¹ The AIS is a standardized form, developed jointly by FSCO, the Canada Revenue Agency, Financial and Consumer Affairs Authority of Saskatchewan, and the Régie des rentes du Québec. It is required to be completed by an actuary and filed with FSCO in conjunction with a funding valuation report.

² The IIS is a Superintendent approved form; required to be completed by the plan administrator. All defined benefit plans other than designated plans or individual pension plans as defined under the Income Tax Act, are required to file the IIS with FSCO.



Between 2012 and 2014, FSCO conducted several pilot projects to refine the RIT and Tier 1 review. They yielded valuable information on how FSCO could perform a more holistic risk review of pension plans. Driven by this experience, FSCO continues towards full implementation of the RBR framework by adopting the structure, roles and responsibilities, processes and measures to bolster our risk-based approach to pension plan regulation.

1.2 FUNDING RELIEF MEASURES

1. In August 2007, Ontario introduced changes to the funding rules in the Regulation for multi-employer pension plans (MEPPs). The Regulation provides temporary funding relief for Specified Ontario Multi-Employer Pension Plans (SOMEPPs) that filed reports with valuation dates on or after September 1, 2007 and before September 1, 2010. The end date for this temporary funding relief was extended twice – once to September 1, 2012, and then to September 1, 2017. During this period, a SOMEPP is exempt from the requirement to fund on a solvency basis.
2. In June 2009, the Regulation was amended to provide temporary solvency funding relief for other Ontario registered DB pension plans meeting certain eligibility conditions. These relief measures are effective with the first filed report with a valuation date on or after September 30, 2008 and before September 30, 2011 (solvency relief report).

The measures provide for:

- deferral of special payments required to liquidate any new going concern and new solvency deficiency for up to 12 months;
- consolidation of existing solvency special payments into a new five-year payment schedule; and
- extension of the period for liquidating a new solvency deficiency from five years to a maximum of 10 years, with member consent.

In November 2012, the Regulation was amended to continue providing temporary solvency relief for eligible Ontario-registered DB pension plans. These relief measures apply to the first filed report with a valuation date on or after September 30, 2011 and before September 30, 2014, and are similar to the ones provided in the June 2009 amendment. They include the option to consolidate existing solvency special payments into a new five-year payment schedule and allow new solvency deficiencies to be amortized over 10 years instead of five years, with member consent. The Regulation has also been amended to generally allow all plans to defer, for up to one year, the start of special payments required to liquidate a new going concern unfunded liability or new solvency deficiency.

In May 2011, the Ontario government implemented changes that would provide solvency funding relief to certain pension plans in the public sector and broader public sector in two stages over several years. Pension plans that meet the criteria for temporary Stage 1 and Stage 2 solvency funding relief are named in Schedule 1 and Schedule 2 (respectively) of Ontario Regulation



178/11. The substantive relief measures are outlined in Regulation 178/11. Eligibility criteria, the application process and additional conditions, as well as examples of steps eligible pension plans could take and the measurement of financial impacts, are not part of the Regulation, but are outlined in a [technical paper](#) issued by the Ministry of Finance.³

3. In November 2015, a new regulation was filed to provide additional solvency funding relief for certain public sector pension plans. Previously, pension plans in Stage 2 of the broader public sector solvency funding relief program were able to make interest-only payments for the first three years and amortize the balance of their Stage 2 solvency deficit over the remaining seven years. This option was only available to plans that entered Stage 2 on or before December 31, 2014. The amending regulation extended this option to all plans accepted to Stage 2.
4. In June 2016, Ontario Regulation 161/16 made under the PBA was filed and came into force on July 1, 2016. This Regulation provides an extension of the temporary solvency relief measures for private sector pension plans enacted by the government in 2009 and in 2012. This extension of the temporary solvency funding relief measures applies to the first valuation report filed with a valuation date on or after December 31, 2015, and before December 31, 2018.
5. Ontario Regulation 350/16 made under the PBA came into force on October 31, 2016. This Regulation amends Ontario Regulation 178/11 (Solvency Funding Relief for Certain Public Sector Pension Plans).

This report contains additional details and summary statistics relating to the use of these relief measures.

1.3 DB PENSION PLAN REPORTING

The AIS and IIS databases enable FSCO to compile relevant pension plan funding and investment data, and identify certain DB pension plan trends in Ontario. This report is FSCO's 13th annual report on the funding and investment of DB pension plans in Ontario.

³ Details of framework and the technical paper can be found at:
<http://www.ontariocanada.com/registry/view.do?postingId=11343&language=en>



1.4 KEY FINDINGS

The report's key findings are summarized below. The funding data analyses are based on actual information from reports filed with FSCO with valuation dates between July 1, 2013 and June 30, 2016. Therefore, the information is drawn from a three-year period and does not have a common date. This is in contrast to projected solvency ratios, which are estimates as at a common date.

Funding Data

1. The 1,333 pension plans included in our data had valuation dates of their last filed reports distributed as follows:

	July 1, 2013 to June 30, 2014	July 1, 2014 to June 30, 2015	July 1, 2015 to June 30, 2016	July 1, 2013 to June 30, 2016
Number of Plans	831	166	336	1,333
Percentage of Plans	63%	12%	25%	100%

2. Overall, the funded position of pension plans improved slightly from what was reported in the [2015 Report](#). In particular:
 - the median funded ratio on a going concern basis has increased to 107% from 106%, and
 - the median funded ratio on a solvency basis has remained the same at 93%.
3. The percentage of plans that were less than fully funded on both a going concern and a solvency basis at their last valuation date decreased compared to the 2015 Report. Specifically:
 - 30% of plans were less than fully funded on a going concern basis (versus 31% in the 2015 Report), and
 - 73% of the plans were less than fully funded on a solvency basis (versus 75% in the 2015 Report).
4. Assumptions and methods for the going concern valuations continue to be quite uniform when compared to prior valuations. For example, the trend analysis shows that:
 - more than 99% of the plans used the unit credit cost method (either with or without salary projections);



- more than 99% of the plans used either a market or smoothed market value of assets (73.5% used a market value, 26.2% used a smoothed market value, 0.1% used a book value, and 0.2% used other methods);
- the average interest rate assumption used for going concern valuations decreased to 4.94% from 5.38% over a four-year period. The reports included in our analysis with valuation dates between July 1, 2015 and June 30, 2016 showed 96% used an interest rate at or below 6.00% and 79% used an interest rate at or below 5.50%; and
- more than 95% of the plans used mortality rates based on the Canadian Pensioners' Mortality tables (CPM2014Proj) and improvement scales published in the final Report, Canadian Pensioners' Mortality on February 13, 2014, by the Canadian Institute of Actuaries.

Projected Solvency Ratio as at December 31, 2016

To provide a snapshot of the estimated solvency funded status of pension plans at a more current date, FSCO also made an estimate of the projected solvency ratio for all plans in aggregate as at a common date of December 31, 2016.

1. The median pension plan solvency ratio was 93% based on valuation dates of the most recently filed reports (which cover the previously noted three-year period). In comparison, the projected median solvency ratios as at December 31, 2015 and December 31, 2016 were estimated to be 83% and 91% respectively.
2. The projections use information contained in the most recently filed valuation reports and estimates the following elements to determine the estimated solvency ratio:
 - the investment returns based on an assumed representative pension plan asset mix;
 - the effect of changes in interest rates from the valuation date of each plan's report to the projection date; and
 - the required contributions specified in each plan's report.
3. The minimum required contributions for 2016, including employer normal cost, member required contributions and special payments, are estimated to decrease by 3% to \$7.7 billion for 2016 from \$7.9 billion for 2015.



Temporary Funding Relief Data

The statistics on the use of the temporary funding relief measures as of December 31, 2016 are:

- Of the 73 MEPPs that contain a defined benefit provision, 49 plans have elected to be treated as a SOMEPP. These 49 SOMEPPs represent 93% of the total plan membership covered by the 73 MEPPs.
- The opportunity to elect temporary solvency funding relief introduced on June 23, 2009 has ended. The three permissible funding relief options were available only for the first filed report with a valuation date on or after September 30, 2008 and before September 30, 2011. FSCO's 2013 Report provides final statistics on the 2009 solvency relief.
- Effective November 1, 2012, the Regulation was amended to continue providing temporary solvency relief similar to the measures introduced in 2009. The opportunity to elect temporary solvency funding relief introduced in 2012 has ended. FSCO's 2015 Report provides final statistics on the 2012 solvency relief.
- In May 2011, the Ontario government implemented changes that would provide solvency funding relief to certain pension plans in the public sector and broader public sector. There were three windows of opportunity for eligible plans to apply for temporary solvency funding relief under these provisions. The final window for applications closed on December 31, 2012. There are 25 pension plans named in Schedule 1 and, as of March 2017, there are 18 pension plans named in Schedule 2 of Ontario Regulation 178/11.
- On June 3, 2016, Ontario Regulation 161/16 made under the PBA was filed. It came into force on July 1, 2016. The regulation provides an extension of the temporary solvency relief measures for private sector pension plans enacted by the government in 2009 and in 2012. This extension of the temporary solvency funding relief measures applies to the first valuation report filed with a valuation date on or after December 31, 2015, and before December 31, 2018.

Trends Analysis Data

The trend analysis shows a slight deterioration in the solvency ratios for valuation dates in the 12-month period ending June 30, 2016, compared with the solvency ratio reported in the previous 12-month period. The median solvency ratio in reports with valuation dates in the 12-month period ending June 30, 2016 is 86%. In comparison, the median solvency ratio for reports with valuation dates in the 12-month period ending June 30, 2014 and June 30, 2015 are 93% and 87% respectively.



Of the 336 pension plans that filed a report with a valuation date between July 1, 2015 and June 30, 2016, 156 (46%) have a solvency ratio of less than 85%. In comparison, the percentage of plans with a solvency ratio of less than 85% in the 12-month periods ending June 30, 2014 and June 30, 2015 are 18% and 48% respectively.

Investment Data

1. The typical asset allocation of pension funds between fixed income and non-fixed income did not change significantly, but the allocation in alternative investments shows an increase over the report period.
2. Large plans have higher average returns and lower investment fees than smaller plans.
3. MEPPs generally invested more of their pension funds in non-fixed income.
4. There do not seem to be significant differences in asset mix, average return and average investment fees between plans of different benefit types.



2.0 FUNDING DATA ANALYSIS

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, 2013 and June 30, 2016. The data was compiled from the AIS and valuation reports FSCO received on or before the data cutoff date of December 31, 2016.

Generally, valuation reports must be filed once every three years on both a going concern and solvency basis. However, solvency concerns revealed in a valuation report require annual filing until solvency concerns no longer exist. Early filings may be required when events such as plan mergers, asset transfer, or sales of businesses occur, and may also be done on a voluntary basis. Unless otherwise noted, the analysis in this report is based on data from a plan's most recently filed valuation report to avoid double counting.⁴

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

- designated plans,
- individual pension plans,
- seven large public sector plans, and
- plans that have been wound up or are in the process of winding up.

Table 2.1 presents a profile of the 1,333 pension plans that have been included in the database used for the funding data analysis. Additional details on the analyzed plans are in Section 8.0 of this report.

Table 2.1 - Summary of Included Plans

Plan/Benefit Type	# of Plans	Active Members	Retired Members	Other Participants	Total Participants	Market Value of Assets (\$Millions)
Final Average	352	123,801	91,627	33,685	249,113	\$59,205
Career Average	94	17,155	14,075	7,311	38,541	\$3,602
Flat Benefit	166	30,187	65,720	17,109	113,016	\$18,773
Hybrid	384	175,152	175,829	82,710	433,691	\$66,163
Frozen Hybrid	159	19,405	39,682	16,667	75,754	\$9,501
Frozen DB Plans [‡]	105	8,227	18,232	8,531	34,990	\$5,293
MEPP	73	374,659	124,201	422,600	921,460	\$29,920
Totals	1,333	748,586	529,366	588,613	1,866,565	\$192,457
Average Age (years)		43.99	73.25	45.23		

[‡]Excluded from analysis in 2015 Report

⁴ 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 a pension plan.



Table 2.2 summarizes the profiles of seven large public sector plans that were excluded from the analysis.

Table 2.2 – Excluded Plans

Plan Type	# of Plans	Active Members	Retired Members	Other Participants	Total Participants	Market Value Of Assets (\$ Millions)
Public Sector Pension Plan	7	772,086	457,205	156,178	1,385,469	\$365,745
Average Age (years)		45.15	71.58	54.25		

2.1 SUMMARY OF FUNDING DATA

Of the 1,333 plans that were analyzed, which together cover 1,866,565 plan members, 395 plans (30%) were less than fully funded on a going concern basis. These underfunded plans cover 1,089,889 plan members (58% of total plan members).

On a solvency basis, 969 (73%) of the 1,333 plans were less than fully funded and cover 1,618,341 plan members (87% of total members).

Tables 2.3, 2.4, 2.5, and 2.6 show the distribution of underfunded plans by plan/benefit type and by membership.

Table 2.3 – Distribution of Underfunded Plans on a Going Concern Basis by Plan Type

Plan/Benefit Type	Total Number of Plans	Number of Underfunded Plans	% of Total Plans by Plan/Benefit Type
Final Average	352	107	30%
Career Average	94	17	18%
Flat Benefit	166	29	17%
Hybrid	384	119	31%
Frozen Hybrid	159	51	32%
Frozen DB Plans	105	34	32%
MEPP	73	38	52%
Total	1,333	395	30%


Table 2.4 – Distribution of Underfunded Plans on a Going Concern Basis by Membership

Plan/Benefit Type	By Membership		
	Total Number of Members	Number of Members in Underfunded Plans	% of Total Membership by Plan/Benefit Type
Final Average	249,113	120,002	48%
Career Average	38,541	9,452	25%
Flat Benefit	113,016	46,583	41%
Hybrid	433,691	128,278	30%
Frozen Hybrid	75,754	26,122	34%
Frozen DB Plans	34,990	14,356	41%
MEPP	921,460	745,096	81%
Total	1,866,565	1,089,889	58%

Table 2.5 - Distribution of Underfunded Plans on a Solvency Basis by Plan Type

Plan/Benefit Type	By Plan		
	Total Number of Plans	Number of Underfunded Plans	% of Total Plans by Plan/Benefit Type
Final Average	352	244	69%
Career Average	94	75	80%
Flat Benefit	166	127	77%
Hybrid	384	270	70%
Frozen Hybrid	159	118	74%
Frozen DB Plans	105	73	70%
MEPP	73	62	85%
Total	1,333	969	73%

**Table 2.6 - Distribution of Underfunded Plans on a Solvency Basis by Membership**

Plan/Benefit Type	By Membership		
	Total Number of Members	Number of Members in Underfunded Plans	% of Total Membership by Plan/Benefit Type
Final Average	249,113	196,596	79%
Career Average	38,541	35,134	91%
Flat Benefit	113,016	101,699	90%
Hybrid	433,691	306,432	71%
Frozen Hybrid	75,754	67,038	88%
Frozen DB Plans	34,990	25,843	74%
MEPP	921,460	885,599	96%
Total	1,866,565	1,618,341	87%

Table 2.7 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 2.7 – Funding Information Grouped By Maturity

Proportion of Solvency Liabilities relating to Pensioners	# of Plans	Total Membership	Solvency Assets (\$ Millions) [‡]	Solvency Liabilities (\$ Millions)	Ratio of Solvency Assets to Solvency Liabilities	Ratio of Active Members to Pensioners
Less than 25%	238	263,047	\$12,714	\$15,659	81%	5.4 : 1
25% ≤ ratio < 50%	590	1,080,409	\$74,877	\$91,899	81%	2.3 : 1
50% ≤ ratio < 75%	392	373,076	\$75,420	\$82,534	91%	0.7 : 1
75% and over	113	150,033	\$28,989	\$33,225	87%	0.1 : 1
Total	1,333	1,866,565	\$192,000	\$223,317	86%	1.4 : 1

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

Tables 2.8 and 2.9 provide a more detailed breakdown of the going concern and solvency funded ratios of different types of DB pension plans.

For all analyzed plans, the median funded ratios were 107% on a going concern basis and 93% on a solvency basis. Of the 73 MEPPs, 52 (71.2%) had a solvency ratio of less than 85%. These 52 plans have approximately 885,599 active, retired and former members, representing approximately 96% of the total MEPP membership.



Table 2.8 - Going Concern Funded Ratio

Funded Ratio (FR)	Final Average	Career Average	Flat Benefit	Hybrid	Frozen Hybrid	Frozen DB Plans	MEPP	All Plans
FR < 0.60	1	0	0	0	0	0	0	1
0.60 ≤ FR < 0.80	12	0	1	10	6	2	2	33
0.80 ≤ FR < 0.90	32	2	8	31	18	11	6	108
0.90 ≤ FR < 1.00	62	15	20	78	27	21	30	253
1.00 ≤ FR < 1.20	181	58	80	188	72	49	26	654
FR ≥ 1.20	64	19	57	77	36	22	9	284
Total	352	94	166	384	159	105	73	1,333
Median Ratio	1.05	1.08	1.11	1.07	1.00	1.00	1.00	1.07

Table 2.9 - Solvency Funded Ratio

Solvency Ratio (SR)	Final Average	Career Average	Flat Benefit	Hybrid	Frozen Hybrid	Frozen DB Plans	MEPP	All Plans
SR < 0.60	2	0	1	0	1	0	18	22
0.60 ≤ SR < 0.80	33	9	21	24	10	7	30	134
0.80 ≤ SR < 0.85	22	5	12	27	15	9	4	94
0.85 ≤ SR < 0.90	67	20	34	68	33	17	5	244
0.90 ≤ SR < 1.00	120	41	59	151	59	40	5	475
1.00 ≤ SR < 1.20	91	17	36	105	32	28	9	318
SR ≥ 1.20	17	2	3	9	9	4	2	46
Total	352	94	166	384	159	105	73	1,333
Median Ratio	0.94	0.91	0.89	0.94	0.93	0.93	0.73	0.93



2.2 SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Below are the key actuarial assumptions and methods used in going concern valuations.

- Over 99% of plans used the unit credit cost method (with salary projections for final average plans and hybrid plans with final average benefits) to calculate their going concern liabilities.

Table 2.10 - Liability Valuation Method

Liability Valuation Method	# of Plans	% of Plans
Unit Credit (with salary projection)	817	61.3%
Unit Credit (with no salary projection)	511	38.3%
Entry Age Normal	3	0.2%
Aggregate	2	0.2%
Total	1,333	100.0%

- Assets were most frequently valued using a market or market-related approach, with more than 99% of plans either using a market or smoothed market value.

Table 2.11 - Asset Valuation Method

Asset Valuation Method	# of Plans	% of Plans
Market	980	73.5%
Smoothed Market	349	26.2%
Book	1	0.1%
Other	3	0.2%
Total	1,333	100.0%

- For going concern valuations, all plans used a mortality table with a base year of 1994 or later. More than 95% of 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 (CIA) (the 2014 CIA CPM Study). The final report includes three new sets of mortality tables (collectively known as the CPM-RPP2014 tables) as well as two sets of improvement scales.



The three mortality tables are:

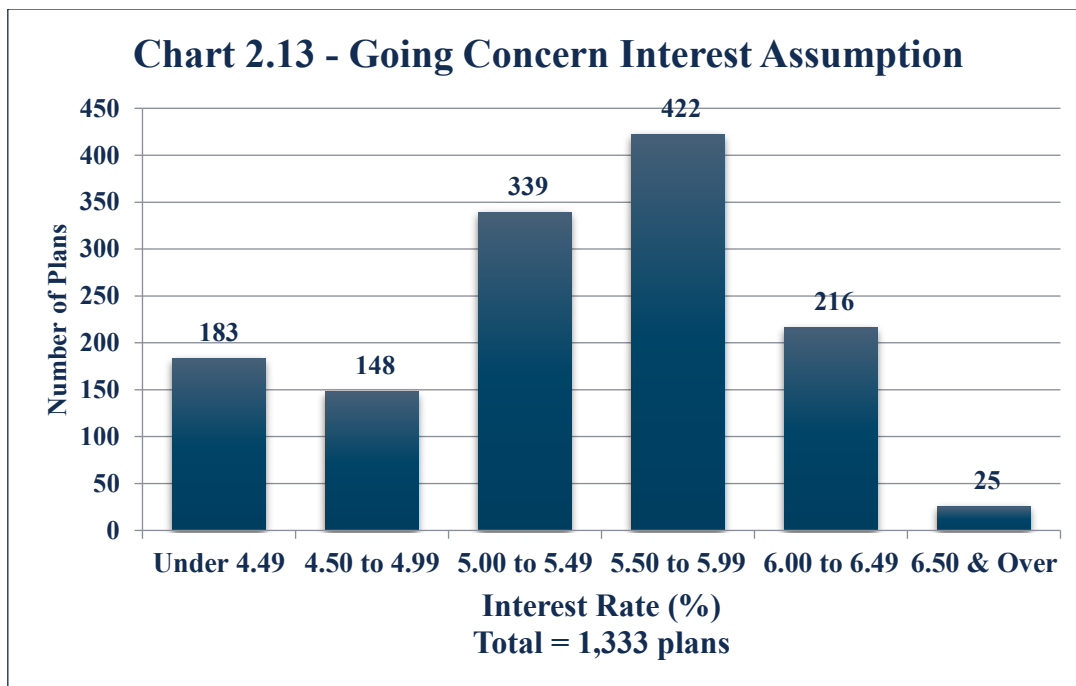
1. 2014 Mortality Table (CPM2014) - developed from the combined experience exhibited under the public and private sector plans included in the RPP Study;
2. 2014 Public Sector Mortality Table (CPM2014Publ) - based on the separate experience exhibited under the public sector plans included in the RPP Study; and
3. 2014 Private Sector Mortality Table (CPM2014Priv) - based on the separate experience exhibited under the private sector plans included in the RPP Study.

The AIS will be amended to identify the actual mortality table and projection scales used as well as any modifications to those tables.

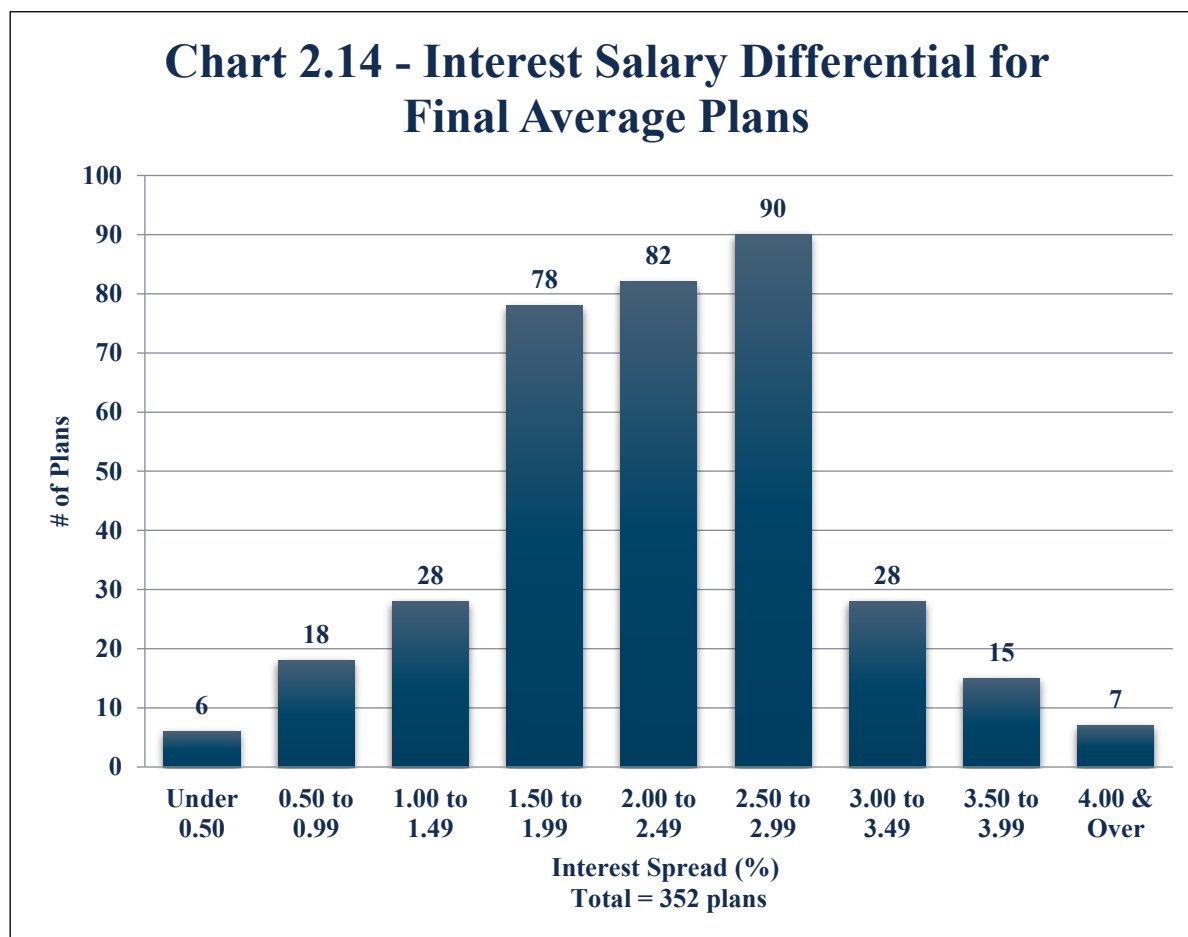
Table 2.12 - Mortality Assumption

Mortality Assumption	# of Plans	% of Plans
1994 GAM Static	1	0.1%
1994 UP	49	3.7%
RP2000 or Variation of RP2000	1	0.1%
UP94 Generational	4	0.3%
Variation of 1994 UP	10	0.7%
CPM-RPP2014	1,268	95.1%
Total	1,333	100.0%

- Interest rate assumptions used to value going concern liabilities were generally lower than in prior years, with approximately 94% of plans using a rate at or below 6.00% and 66% of plans using a rate at or below 5.50%.
- Interest rates continued to fall within a relatively narrow range, with 69% of the plans using a rate between 5.0% and 6.0% inclusive.
- Of the 25 plans that used a going concern interest rate assumption of 6.50% or over, 21 plans used an interest rate of exactly 6.50%. Of the 216 plans that used a going concern interest rate assumption in the range of 6.00% to 6.49%, 166 plans used an interest rate of exactly 6.00%.



- 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 75% of all plans providing final average benefits. The average spread between the interest assumption and the salary increase assumption was 2.16%.
- Of the 28 final average plans with an interest-salary differential in the range of 3.00% to 3.49%, 15 plans had an interest-salary differential of exactly 3.00%. Of the 90 final average plans with an interest-salary differential in the range of 2.50% to 2.99%, 28 plans had an interest-salary differential of exactly 2.50%. Of the 82 final average plans with an interest-salary differential in the range of 2.00% to 2.49%, 37 plans had an interest-salary differential of exactly 2.00%.



- Table 2.15 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. For confidentiality reasons, the three plans with more than 50,000 total membership each were excluded from this analysis.

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 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 5,000 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 [2015 Report](#), with slight increases for plans with less than 100 members.



Table 2.15 - Provision for Wind Up Expenses

Plan Membership	Total Plans	Total Membership	Wind Up Expenses		
			Total Wind Up Expenses (\$)	Average Per Plan (\$)	Average Per Member (\$)
<100	435	20,554	25,655,650	58,979	1,248
100-499	492	120,305	67,164,065	136,512	558
500-999	155	108,488	41,314,900	266,548	381
1,000-4,999	190	406,422	108,222,200	569,591	266
5,000-9,999	34	244,336	45,350,000	1,333,824	186
10,000-49,999	24	403,981	164,213,000	6,842,208	406
All Plans	1,330	1,304,086	451,919,815	339,789	347



3.0 TEMPORARY FUNDING RELIEF

This section provides information on membership and funding statistics as well as the impact on funding costs for plans that used the temporary funding relief measures available under the PBA and Regulation.

3.1 SPECIFIED ONTARIO MULTI-EMPLOYER PENSION PLANS (SOMEPPS)

For a MEPP that elects to be treated as a SOMEPP, plan contributions 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 instead of the usual 15 years. There are also funding requirements for benefit improvements; any increase in the going concern unfunded liability as a result of the improvements must 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 funding relief, although solvency valuations are still required to be performed and their results must be set out in the valuation report.⁵

The following tables provide selected statistics on MEPPs that contain a defined benefit provision. As of December 31, 2016, 49 of the 73 MEPPs have elected to become SOMEPPs.

Table 3.1 - Membership Information

	# of Plans	Total (<i>Median</i>) Membership Count			
		Active Members	Retired Members	Other Participants	Total
SOMEPPs	49	347,700 (1,129)	108,008 (664)	399,464 (1,457)	855,172 (3,458)
Non-SOMEPPs	24	26,959 (674)	16,193 (249)	23,136 (150)	66,288 (1,387)
Total (All DB MEPPs)	73	374,659 (940)	124,201 (517)	422,600 (823)	921,460 (2,660)

⁵ More information on SOMEPPs is available at:
<http://www.fsc.gov.on.ca/en/pensions/actuarial/Pages/MEPPsolvency-qanda.aspx>



Table 3.2 - Funding Information

	Total (Median) Value			
	Market Value of Assets	Solvency Assets ‡	Solvency Liabilities	Ratio of Solvency Assets to Solvency Liabilities
	(\$ Millions)			
SOMEPPs	24,537 (139.8)	24,423 (139.5)	41,082 (226.9)	59.4% (66.9%)
Non-SOMEPPs	5,383 (91.0)	5,297 (90.5)	5,689 (110.1)	93.1% (93.4%)
Total (All DB)	29,920 (130.4)	29,720 (130.4)	46,771 (180.0)	63.5% (73.0%)

‡ Market value of assets less provision for wind up expenses

Plans that elected to become 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 size of solvency liabilities for SOMEPPs is approximately twice as large as that of non-SOMEPPs.

In terms of funding levels, SOMEPPs are significantly less well funded than non-SOMEPPs. The median solvency ratio for SOMEPPs is 66.9% compared to 93.4% for non-SOMEPPs.

3.2 2009 SOLVENCY FUNDING RELIEF

Effective June 23, 2009, and for a temporary period, the administrator of a plan that had met certain criteria may choose one or more of the following three funding relief options in the first filed report with a valuation date on or after September 30, 2008 and before September 30, 2011 (referred to herein as the 2009 solvency relief report):⁶

- Option 1: Defer, up to one year, the start of special payments required to liquidate any new going concern unfunded liability or new solvency deficiency determined in the 2009 solvency relief report.
- Option 2: Consolidate special payments for pre-existing solvency deficiencies into a new five-year payment schedule that starts on the valuation date of the 2009 solvency relief report.
- Option 3: With the consent of active and former members if the plan is not jointly governed, extend the period for liquidating the new solvency deficiency from five years to a maximum of 10 years.

The opportunity to elect temporary solvency funding relief introduced on June 23, 2009, has ended. [FSCO's 2013 Report](#) provides final statistics on the 2009 solvency relief.

⁶ More information on temporary solvency funding measures is available at: <http://www.fSCO.gov.on.ca/en/pensions/actuarial/Pages/solvency.aspx>



3.3 2012 SOLVENCY FUNDING RELIEF

Effective November 1, 2012, the Regulation was amended to continue to provide temporary solvency relief for private sector pension plans introduced by the government in June 2009. The measures in this amendment are similar to the measures introduced in 2009, and apply to the first filed report with a valuation date on or after September 30, 2011, and before September 30, 2014 (referred to herein as the 2012 solvency relief report).

The measures include:

- Option 4: Consolidating existing special payments for solvency deficiencies into a new five-year payment schedule that starts on the valuation date of the 2012 solvency relief report; and
- Option 5: Extending the period for liquidating a new solvency deficiency determined in the report from a maximum of five years to a maximum of 10 years, subject to the consent of plan members.

It is important to note that the Regulation was amended to permit all plans to defer, for up to one year, the start of special payments required to liquidate a new going concern unfunded liability or new solvency deficiency.

The opportunity to elect temporary solvency funding relief introduced in 2012 has ended. [FSCO's 2015 Report](#) provides final statistics on the 2012 solvency relief.

3.4 2016 SOLVENCY FUNDING RELIEF

On June 3, 2016, Ontario Regulation 161/16 made under the PBA was filed. The regulation, which came into force on July 1, 2016, provides an extension of the temporary solvency relief measures for private sector pension plans enacted by the government in 2009 and in 2012. This extension applies to the first valuation report filed with a valuation date on or after December 31, 2015, and before December 31, 2018.

The measures include:

- Option 6: Consolidating existing special payments for solvency deficiencies into a new five-year payment schedule that starts on the valuation date of the 2016 solvency relief report; and
- Option 7: Extending the period for liquidating a new solvency deficiency determined in the report from a maximum of five years to a maximum of 10 years, subject to the consent of the plan members.

**Table 3.3 - Distribution of 2016 Solvency Relief Options Elected**

Election	Number of Plans	% of Plans	Previously Elected Solvency Relief
Option 6 only	37	77%	26
Option 7 only	5	10%	5
All Options	6	13%	5
Total	48	100%	36

Based on the valuation reports included in the database, a total of 50 eligible plans elected to use one or more of the 2016 funding relief options. However, our analysis omits one designated plan and one plan that subsequently transferred its registration out of the province of Ontario. The resulting 48 plans reported in our database are referred to as the '2016 Electing Plans' in this report.

Because the election of 2016 solvency funding relief is based on the first report filed with a valuation date on or after December 31, 2015 and before December 31, 2018, the number of plans electing relief may increase for plans that have not filed a valuation report within the election period.

Table 3.3 shows the distribution of options chosen by the 2016 Electing Plans. As shown, the use of only Option 6 was the most prevalent choice, accounting for 77% of all plan elections. The next most common choice was the combination of Options 6 and 7, which accounted for 13% of plan elections. Of the 48 plans that elected various options under the 2016 solvency funding relief, 36 of those plans also made an election for solvency relief under either the 2009 or 2012 solvency funding relief options.

Table 3.4 – Percentage of Eligible Plans Electing 2016 Solvency Relief Options

	Number of Plans	Number of Eligible Plans That Have Filed a 2016 Valuation Report within the specified period	2016 Electing Plans	
			Number of Plans	Percentage of Plans
Plans in database	1,333	282	48	17%
Out of Province			1	
Designated Plans			1	
Total			50	



Of the 282 eligible plans that have filed their 2016 solvency relief reports, 48 plans elected to use one or more of the 2016 solvency funding relief options.

Tables 3.5 and 3.6 present a profile of the 2016 Electing Plans as at December 31, 2016.

Table 3.5 Membership Information for the 2016 Electing Plans

	Number of Plans	Membership Count			
		Active Members	Retired Members	Other Participants	Total
Plans in database	48	20,053	34,377	8,136	62,566
Median		160	164	61	436

Table 3.6 Funding Information for the 2016 Electing Plans

	Number of Plans	Solvency Assets	Solvency Liabilities	Ratio of Solvency Assets to Solvency Liabilities
		(\$ Millions)		
Plans in database	48	6,053	7,995	75.7%
Median Value		52	60	80.2%

3.5 SOLVENCY FUNDING RELIEF FOR BROADER PUBLIC SECTOR PENSION PLANS

In May 2011, the Ontario government implemented changes that would provide solvency funding relief to certain pension plans in the public sector and broader public sector. Ontario Regulation 178/11 implemented these changes.

The funding relief is to be provided in two stages (referred to as Stage 1 and Stage 2):

- Stage 1 relief starts from the plan's Stage 1 valuation date, which is set out in the Schedule to Ontario Regulation 178/11. It is a three-year period during which plans would be permitted to fund to a lower solvency standard with required minimum interest payments.
- At the end of Stage 1, each plan would be assessed by the Minister of Finance, based on technical measures, to determine whether sufficient progress had been made to meet its sustainability commitments.



- Plans that demonstrate sufficient steps have been taken towards sustainability would be eligible to enter Stage 2 of the process.
- Stage 2 would provide the plan sponsor with up to 10 years to implement negotiated plan changes and liquidate solvency deficiencies.
- Plans that fail to enter Stage 2 or that choose not to enter Stage 2 would be transitioned back to the normal PBA funding rules.
- Contribution holidays (Stage 2) and benefit improvements (Stage 1 and 2) would be restricted while under the funding relief. These restrictions would remain in place for a period of time after exiting the process.
- Pension plans in Stage 2 of the broader public sector solvency funding relief program are able to make interest only payments for the first three years in Stage 2, and amortize the balance of their Stage 2 solvency deficit over the remaining seven years.

The substantive relief measures are outlined in Regulation 178/11; they were extended and expanded by amendments to Regulation 178/11 in 2013, 2015 and 2016. Eligibility criteria, the application process and additional conditions, as well as examples of steps eligible pension plans could take and the measurement of financial impacts are not part of the Regulation, but are outlined in a technical paper issued by the Ministry of Finance. Pension plans that meet the criteria for temporary Stage 1 and Stage 2 solvency funding relief are named in Schedule 1 and Schedule 2 (respectively) of Ontario Regulation 178/11.

Ontario Regulation 350/16 made under the PBA came into force on October 31, 2016. This Regulation provides additional Stage 2 temporary solvency relief for the Broader Public Sector (BPS) Pension Plans. This additional relief applies to the first subsequent valuation report filed after the Stage 2 valuation report for pension plans listed in Schedule 2. The valuation date of the first subsequent report must be on or before December 31, 2018. A Notice of the Election for temporary solvency relief must also be filed with the Superintendent no later than the day on which the first subsequent report is filed.

Generally, the solvency relief measures that apply to these plans are as follows:

- Any special payments from the Stage 2 valuation report are no longer required on and after the day that is 12 months after the valuation date of the first subsequent report.
- The minimum required solvency special payments would be determined based on a point between the solvency ratio (i.e. solvency assets ÷ solvency liabilities) and 100%.
- The modified solvency deficiency (i.e. modified solvency liabilities – solvency assets – solvency asset adjustment) would be liquidated by equal monthly instalments over a period not



more than seven years, starting no later than 12 months after the valuation date of the first subsequent report.

- The minimum required special payments commencing no later than 12 months after the first subsequent report valuation date would be determined as the sum of:
 - The going concern special payments;
 - The special payments to liquidate the modified solvency deficiency; and
 - The interest payments on the remaining solvency deficiency not being liquidated.

Ontario Regulation 350/16 also granted extended Stage 1 solvency funding relief for one named BPS pension plan.

There are 25 pension plans listed in Schedule 1 and, as of March 2017, 18 pension plans are listed in Schedule 2 of Ontario Regulation 178/11.

Table 3.7 presents the profile of the 25 plans based on their most current valuation report.

Table 3.7 – Plans covered by Reg. 178/11 based on the most current filed valuation report

# of Plans	Active Members	Retired Members	Other Participants	Total Participants	Market Value Of Assets	Going Concern Liabilities	Solvency Liabilities
					(\$ Millions)		
25	87,609	62,152	17,857	167,618	40,032	41,755	44,594
Average Age	46.65	74.60	49.41	57.31			



4.0 TRENDS ANALYSIS

The following trends analysis incorporates data from all filed reports with valuation dates between July 1, 2012 and June 30, 2016.

4.1 SOLVENCY FUNDED STATUS

Table 4.1 shows a breakdown of plans by solvency ratios for the following valuation periods:⁷

- 2012 Valuation Period denotes valuation dates between July 1, 2012 and June 30, 2013
- 2013 Valuation Period denotes valuation dates between July 1, 2013 and June 30, 2014
- 2014 Valuation Period denotes valuation dates between July 1, 2014 and June 30, 2015
- 2015 Valuation Period denotes valuation dates between July 1, 2015 and June 30, 2016

The majority of plans have a valuation date of either December 31 or January 1. Plans that have solvency concerns are required to file valuation reports annually. Having filed a report in more than one of the valuation periods noted above, they would be represented in more than one valuation period.

Table 4.1 – Breakdown of Plans by Solvency Ratios

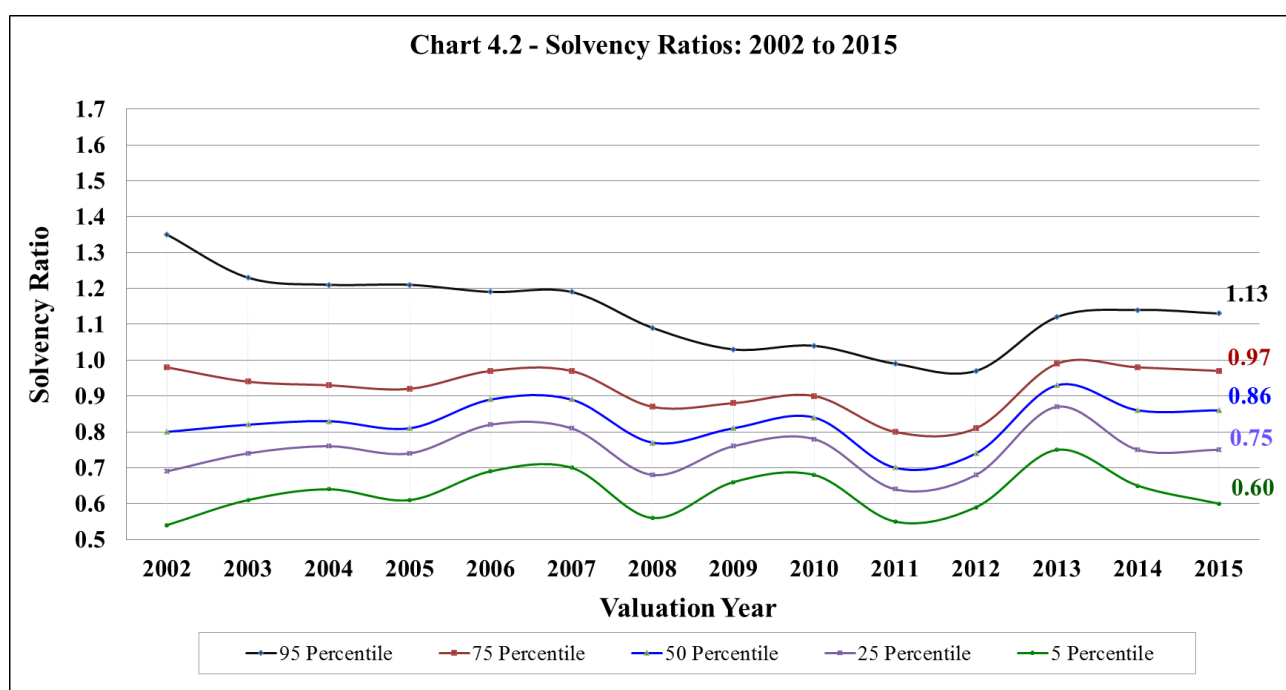
Solvency Ratio (SR)	2012		2013		2014		2015	
	# of Plans	% of Plans	# of Plans	% of Plans	# of Plans	% of Plans	# of Plans	% of Plans
SR < 0.60	48	6.6%	9	0.8%	9	2.8%	18	5.4%
0.60 ≤ SR < 0.80	477	65.9%	97	8.4%	106	32.6%	101	30.0%
Sub-Total < 0.8	525	72.5%	106	9.2%	115	35.4%	119	35.4%
0.80 ≤ SR < 0.85	71	9.8%	111	9.6%	34	10.5%	37	11.0%
0.85 ≤ SR < 0.90	62	8.6%	220	19.1%	30	9.2%	43	12.8%
0.90 ≤ SR < 1.00	36	5.0%	439	38.1%	62	19.1%	70	20.8%
Sub-Total < 1.00	694	95.9%	876	76.0%	241	74.2%	269	80.0%
1.00 ≤ SR < 1.20	20	2.7%	250	21.7%	71	21.8%	54	16.1%
SR ≥ 1.20	10	1.4%	27	2.3%	13	4.0%	13	3.9%
Total	724	100.0%	1,153	100.0%	325	100.0%	336	100.0%
Median Ratio	0.73		0.93		0.87		0.86	

⁷ The number of plans for 2012-2014 inclusive may differ from those reported in the prior report due to (a) reports filed after last year's cut-off date of Dec. 31, 2015, and (b) plans that have been wound up, converted to a DC arrangement, or became a frozen DB plan with no DB/DC accruals.



Table 4.1 shows that the solvency ratios have decreased slightly during the 2014 and 2015 valuation periods. The percentage of plans with a solvency ratio less than 0.85 has increased slightly from 45.9% in 2014 to 46.4% in 2015. The proportion of underfunded plans on a solvency basis (i.e., a solvency ratio less than 1.0) also increased slightly from 74.2% in 2014 to 80.0% in 2015.

Chart 4.2 shows the distribution of solvency ratios at different percentiles from 2002 to 2015. Since the 2007 valuation period, the solvency ratios of pension plans have been volatile.

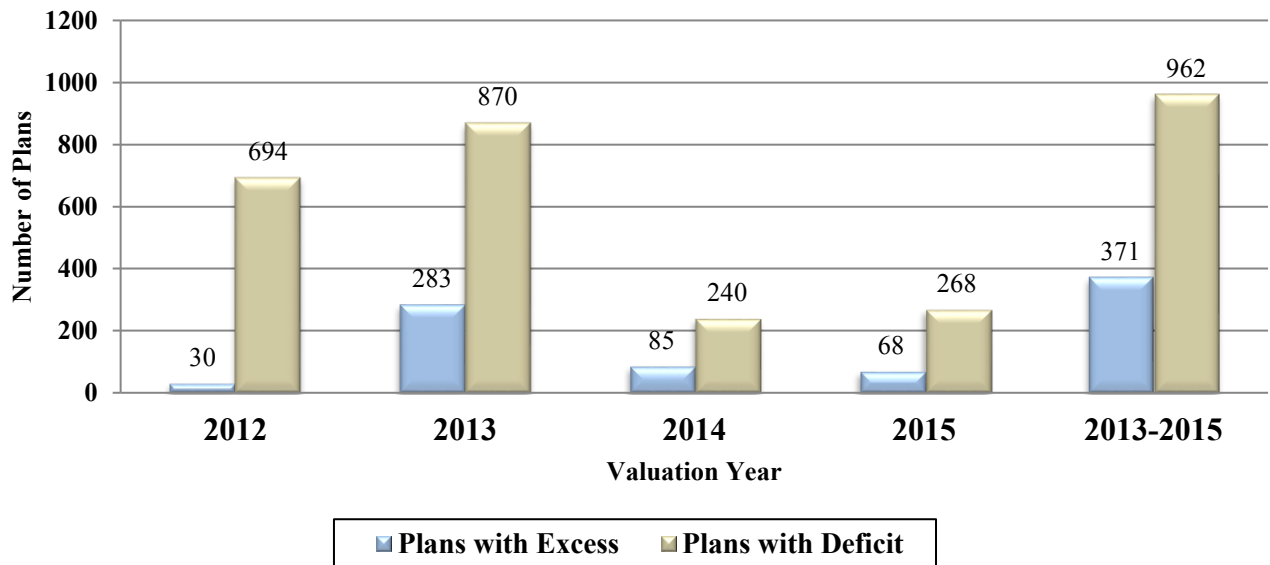


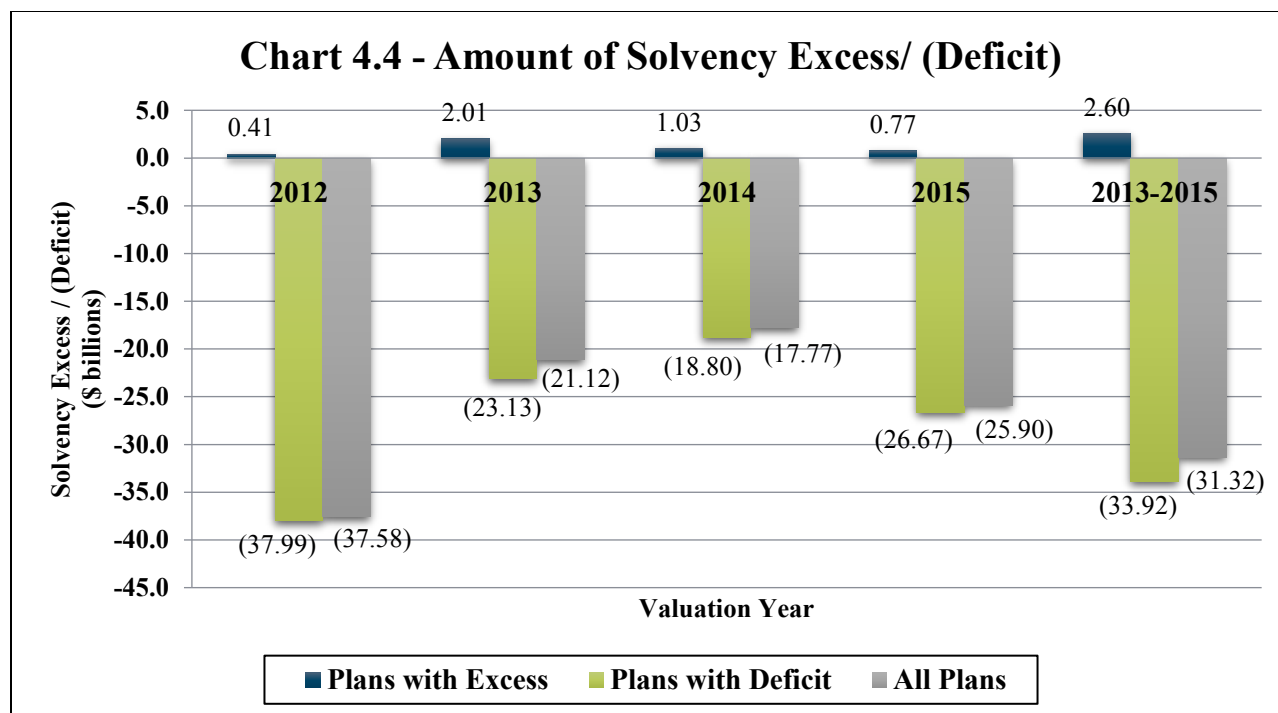
Charts 4.3 and 4.4 compare plans with a solvency excess to those with a solvency deficit for each of the four valuation periods from 2012 to 2015, as well as for the three-year valuation period of 2013 to 2015.⁸ Chart 4.3 compares the number of plans and Chart 4.4 compares the amount of solvency excess or deficit. The number of plans with solvency excesses has remained well below the number of plans with solvency deficits.

⁸ Individual valuation periods include those plans that filed a report with a valuation date that fell during that individual period. The 2013-15 period includes only the last funding valuation report filed for a plan with a valuation date falling between July 1, 2013 and June 30, 2016. The total number of plans included in each of the 2013, 2014 and 2015 valuation periods is therefore higher than the number of plans included in the combined period 2013-2015.



Chart 4.3 - Number of Plans with Solvency Excess vs. Solvency Deficit





The total level of under funding for the 1,333 DB plans analyzed in this Report shows a *net* solvency deficit of \$31.3 billion (after allowance for expenses) on solvency liabilities of \$223.3 billion. In contrast, the *net* solvency deficit shown in the 2015 Report was \$27.0 billion on solvency liabilities of \$204.7 billion.

Under the Regulation, where a valuation report filed with FSCO discloses that a solvency deficiency exists, the employer is required to make special payments to eliminate the deficiency within five years. These rules are modified for plans that availed themselves of either the solvency relief measures or that are being treated as SOMEPPs.

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 255 plans that excluded one or more of these benefits, resulting in a reduction of liabilities totaling \$22.7 billion. Thus, the total wind up funding shortfall for those plans that filed a report with valuation dates between July 1, 2013 and June 30, 2016 would have exceeded their net solvency deficit by the same amount. This translates into a wind up funding deficit of \$54.0 billion (\$31.3 billion plus \$22.7 billion), after making allowances for expenses, on wind up liabilities of \$246.0 billion. It 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. Since 2012, there has been a trend to use lower interest rate assumptions.

Table 4.5 - Interest Rate Assumption by Valuation Period

Rate (%)	2012		2013		2014		2015	
	# of Plans	% of Plans	# of Plans	% of Plans	# of Plans	% of Plans	# of Plans	% of Plans
Rate < 4.00	25	3.5%	40	3.5%	34	10.5%	47	14.0%
4.00 ≤ Rate < 4.50	35	4.8%	56	4.9%	26	8.0%	34	10.1%
4.50 ≤ Rate < 5.00	79	10.9%	117	10.1%	38	11.7%	44	13.1%
5.00 ≤ Rate < 5.50	153	21.1%	270	23.4%	85	26.2%	101	30.1%
5.50 ≤ Rate < 6.00	269	37.2%	427	37.0%	82	25.2%	67	19.9%
6.00 ≤ Rate < 6.50	137	18.9%	214	18.6%	53	16.3%	39	11.6%
6.50 ≤ Rate < 7.00	26	3.6%	28	2.4%	7	2.2%	4	1.2%
Rate ≥ 7.00	0	0.0%	1	0.1%	0	0.0%	0	0.0%
Total	724	100.0%	1,153	100.0%	325	100.0%	336	100.0%
Average (%)	5.38%		5.37%		5.11%		4.94%	

The average of the assumed interest rates declined to 4.94% from 5.38% over the July 1, 2012 to June 30, 2016 period. As has been the case since the 2012 valuation period, the most prevalent assumed interest rates remained within the 5.00% to 6.00% range.

The proportion of plans using an interest rate assumption of 6.00% or higher has decreased in each valuation period, to 12.8% in the 2015 valuation period from 22.5% of plans in the 2012 valuation period. Of the 2015 valuations filed, 96.1% used an assumed interest rate at or below 6.00%.



Solvency Interest Rates

Chart 4.6 shows the non-indexed commuted value rates over the preceding six-year period based on the Canadian Institute of Actuaries' Standards of Practice – Practice Specific Standards for Pension Plans. On June 9, 2015, the Actuarial Standards Board promulgated the use of the 2014 Canadian Pensioners Mortality Table (CPM2014) combined with mortality improvement scale CPM Improvement Scale B (CPM-B), effective October 1, 2015. Use of mortality improvement scale CPM-B1D2014 is acceptable as an interim measure for calculations up to and including December 31, 2016. Regulations under the PBA were filed and came into effect on December 10, 2015, mandating the mortality rates determined according to these tables be used for calculation of commuted values on termination.

The Government of Canada (GoC) bond yields used in calculating the non-indexed commuted value interest rates and non-indexed annuity proxy interest rates have declined between January 2008 and December 2015.

The Canadian Institute of Actuaries frequently updates the methodology for estimating the cost of purchasing a group annuity over this period.

The most recent [guidance](#) was issued on March 1, 2017, from the Committee on Pension Plan Financial Reporting (PPFRC). It concluded that for valuations with effective dates between December 31, 2016 and December 30, 2017, 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 as the unadjusted average yield on GoC marketable bonds with maturities over 10 years (CANSIM series V39062) increased arithmetically by between 70 to 100 basis points (bps), in conjunction with the 2014 Canadian Pensioners' Mortality Table (CPM2014) combined with mortality improvement scale CPM Improvement Scale B (CPM-B) with no adjustments for sub- or super-standard mortality (CPM2014Proj). The spread above the CANSIM series V39062 would be determined based on the duration of the liabilities expected to be settled through the purchase of a group annuity.

Chart 4.7 shows the non-indexed interest rates for annuity purchases since 2009 as set out in the Canadian Institute of Actuaries' (CIA) Educational Notes, which provide guidance for Assumptions for Hypothetical Wind Up and Solvency Valuations. Effective June 30, 2013, the CIA began issuing guidance based on the duration of the liabilities expected to be settled through the annuity purchase. The chart shows estimated interest rates based on liabilities with a medium duration, where applicable. The mortality table used to estimate the applicable interest for annuity purchases was changed in September 2015 from UP94Proj to CPM2014Proj, resulting in a significant discontinuity in the applicable interest rate spread. For example, the chart shows an annuity proxy rate of 3.19% at September 31, 2015 which is based on the CANSIM v39062 rate of 2.09%, a medium duration of 11.0 years, and the corresponding spread of 110 basis points. Had UP94Proj been used, the spread would likely be approximately 63 basis points lower.

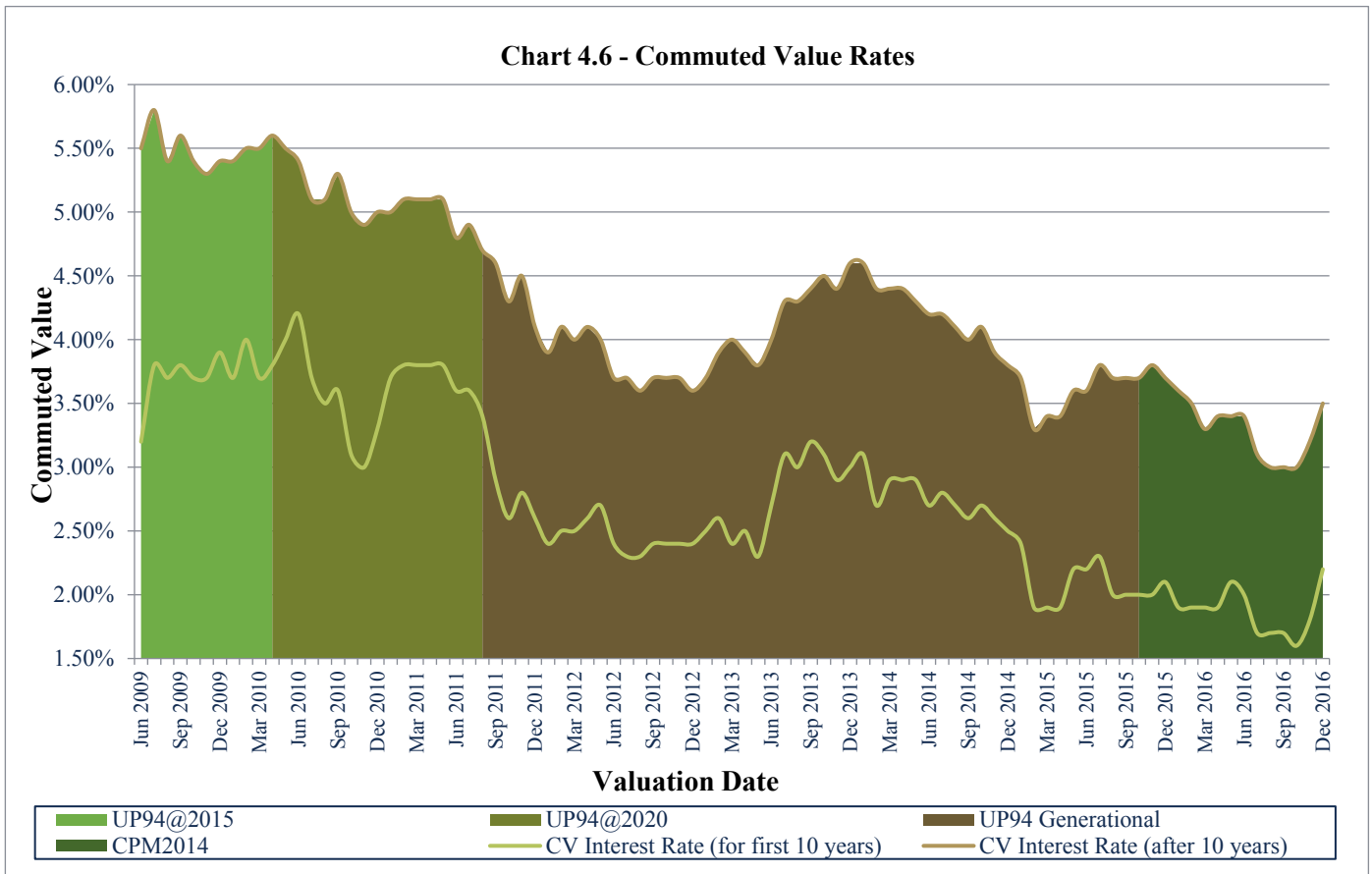
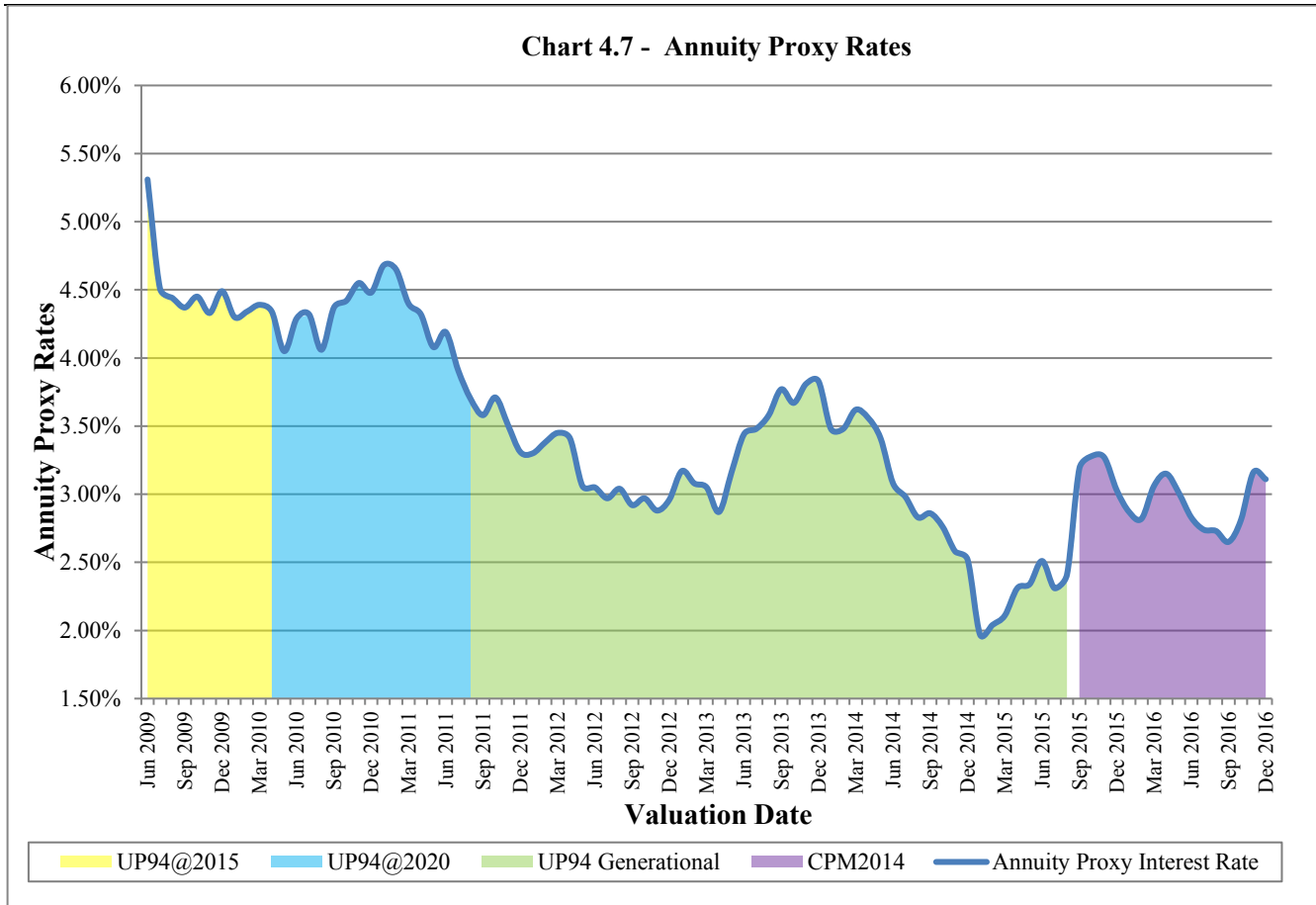




Chart 4.7 - Annuity Proxy Rates





Mortality Basis

Table 4.8 - Mortality Assumption by Valuation Period

Mortality Assumption	2012		2013		2014		2015	
	# of Plans	% of Plans	# of Plans	% of Plans	# of Plans	% of Plans	# of Plans	% of Plans
1994 GAM Static	0	0.0%	2	0.2%	0	0.0%	1	0.3%
GAR94 or Variation of GAR94	5	0.7%	0	0.0%	0	0.0%	0	0.0%
Variation of GAM94	2	0.3%	0	0.0%	0	0.0%	0	0.0%
1994 UP	621	85.8%	66	5.7%	13	4.0%	4	1.2%
RP2000 or Variation of RP2000	20	2.8%	4	0.3%	0	0.0%	0	0.0%
UP94 Generational	2	0.3%	4	0.3%	0	0.0%	0	0.0%
1994 UP Variant	58	8.0%	23	2.0%	0	0.0%	0	0.0%
Variation of Buck 95 Table	5	0.7%	5	0.4%	0	0.0%	0	0.0%
CPM-RPP2014	11	1.5%	1,049	91.0%	312	96.0%	331	98.5%
Total	724	100.0%	1,153	100.0%	325	100.0%	336	100.0%

Table 4.8 shows the distribution of the mortality tables used in going concern valuations. Starting in the 2012 valuation period, all plans used a mortality table with a base year of 1994 or later, i.e., the 1994 tables (GAM, GAR, UP). The majority of plans have begun using the Canadian pensioners' mortality tables (CPM-RPP2014) and improvement scales published in the 2014 CIA CPM Study.

Data used in the preparation of this report does not contain information to distinguish between the three CPM mortality tables or projection scales used nor any possible variations of these tables. The AIS will be amended to identify the actual mortality table and projection scales used, as well as any modifications thereof.



5.0 INVESTMENT DATA ANALYSIS

The plans included in the investment data analysis are a subset of the 1,333 plans identified in section 2 of this report. This subset consists of plans that have filed an IIS for the most recent monitoring cycle (fiscal year-ends between July 1, 2015 and June 30, 2016). There are 1,267 plans included in the investment data analysis, representing 95% of the plans included in the funding data analysis.⁹

For hybrid plans, only the defined benefit assets are included in the data.

5.1 SUMMARY OF PENSION FUND PROFILES

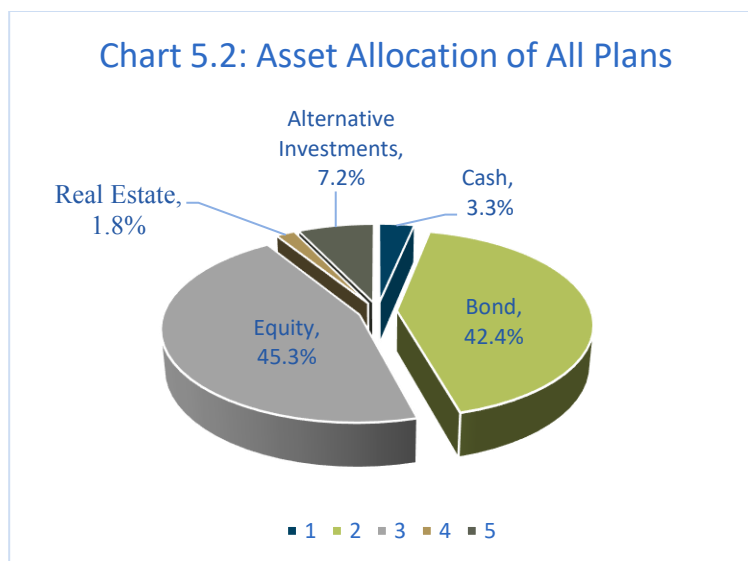
In aggregate, the asset mix of the 1,267 pension funds for the most recent monitoring cycle is described in Table 5.1 and depicted in Chart 5.2.

Table 5.1 – Investment Profile of All Plans as a Whole

Asset Class	Market Value (\$ Millions)	% of Total Investments
Cash	6,699	3.3%
Bond	84,282	42.4%
Equity	90,092	45.3%
Real Estate	3,560	1.8%
Alternative Investments ¹⁰	14,279	7.2%
Total	198,911	100.0%

⁹ Plans not included in the investment data analysis subset are primarily plans with outstanding IIS filings.

¹⁰ Alternative Investments include hedge funds, private equity, infrastructure, currency hedging, resource properties, commodities, etc.

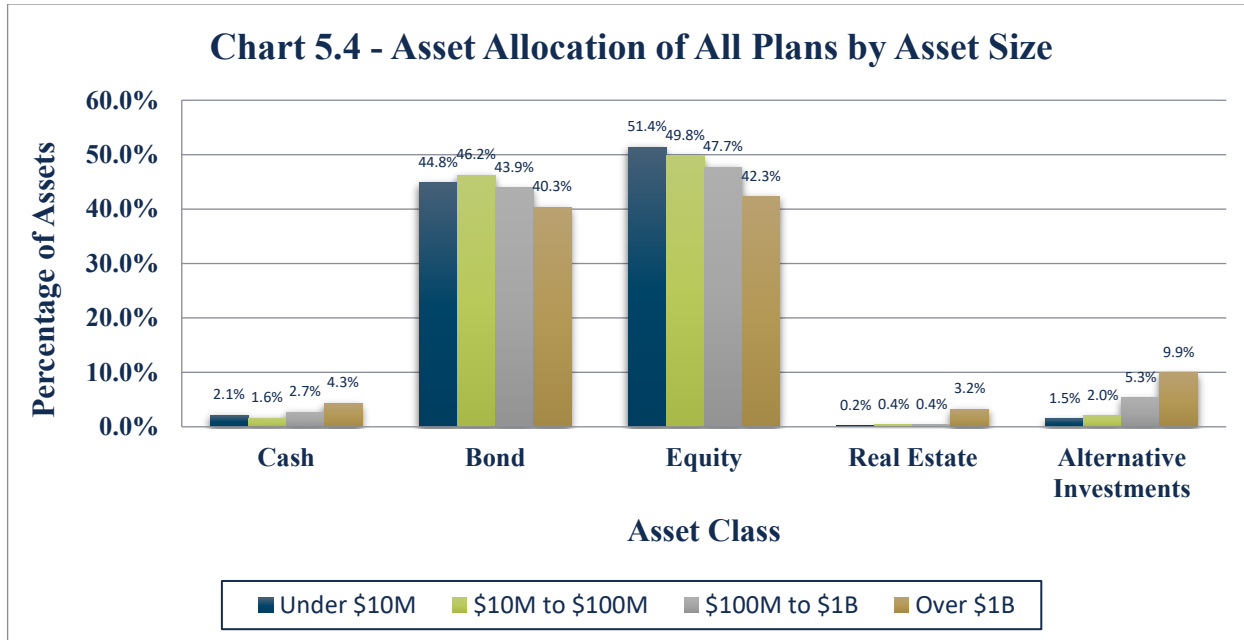


On a broad basis, fixed income assets (consisting of cash and bonds) constitute 46% of total investments. Non-fixed income assets (consisting of equity, real estate and alternative investments) constitute 54% of total investments.

Pension funds with different asset sizes differ in how much is allocated to each asset class. Big pension funds allocate more assets in real estate and alternative investments and less in bond and equity than small pension funds. Notably, pension funds with over \$1 billion in assets, invest on average, 13.1% in real estate and alternative investments. The asset allocation of all plans by asset size is shown in Table 5.3 and depicted in Chart 5.4.

Table 5.3 - Asset Allocation of All Plans by Asset Size

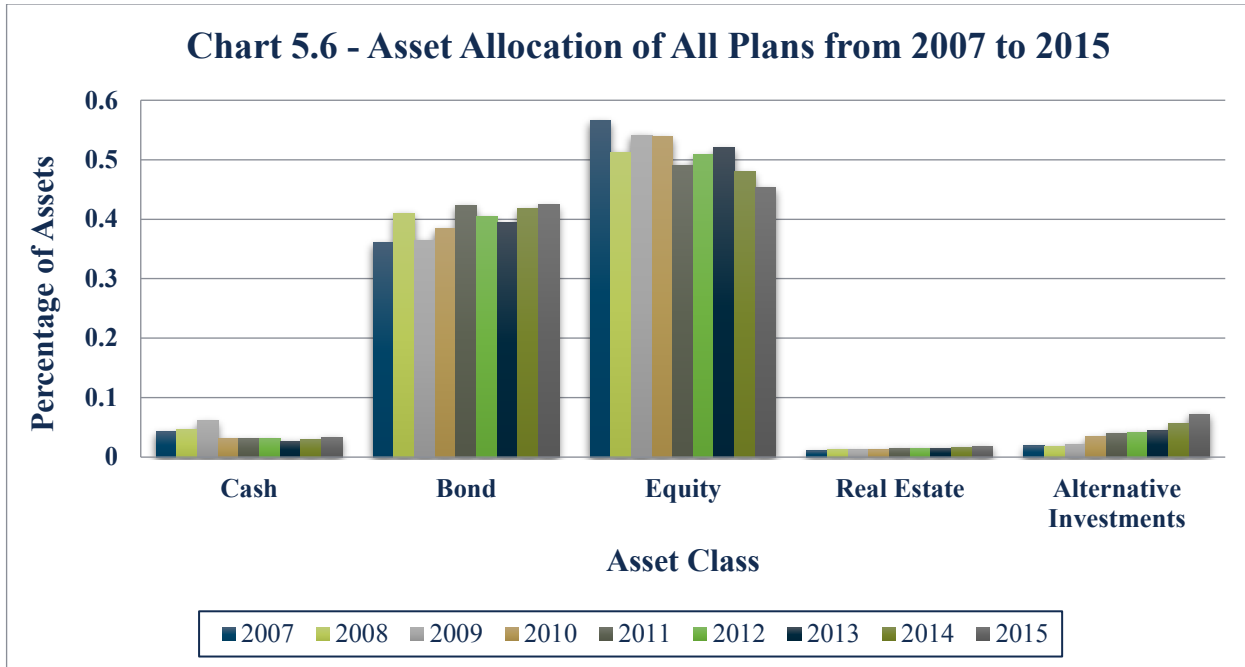
Size of Plan Asset		Under \$10M	\$10M to \$100M	\$100M to \$1B	Over \$1B	All Plans
# of Plans		390	573	265	39	1,267
Asset Class	Cash	2.1%	1.6%	2.7%	4.3%	3.3%
	Bond	44.8%	46.2%	43.9%	40.3%	42.4%
	Equity	51.4%	49.8%	47.7%	42.3%	45.3%
	Real Estate	0.2%	0.4%	0.4%	3.2%	1.8%
	Alternative Investments	1.5%	2.0%	5.3%	9.9%	7.2%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%



Based on data used in previous annual reports on the funding and investment of DB pension plans in Ontario from 2007 to 2015, there seems to have been a general trend in pension funds' asset allocation to increase investments in bonds and decrease investments in equity. Allocation in alternative investments increased consistently over the period. The asset allocation of all plans over this period is shown in Table 5.5 and depicted in Chart 5.6.

Table 5.5 - Asset Allocation of All Plans from 2007 to 2015

Asset Class	% of Total Investments								
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Cash	4.3%	4.6%	6.1%	3.1%	3.1%	3.1%	2.7%	2.9%	3.3%
Bond	36.1%	41.0%	36.5%	38.4%	42.3%	40.4%	39.4%	41.8%	42.4%
Equity	56.6%	51.3%	54.1%	53.9%	49.1%	50.8%	52.0%	48.0%	45.3%
Real Estate	1.1%	1.3%	1.2%	1.2%	1.5%	1.5%	1.5%	1.7%	1.8%
Alternative Investments	1.9%	1.8%	2.1%	3.4%	4.0%	4.2%	4.4%	5.6%	7.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%



5.2 SUMMARY OF FUND PERFORMANCE

This section provides statistics on asset mix and investment performance by various categories for the latest monitoring cycle.

The 1,267 plans included in the analysis are very diverse. To illustrate investment results for pension plans that have different characteristics, the asset mix and performance data are presented by different plan type, benefit type, plan size, solvency ratio and percentage invested in investment funds.

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 rate of return, net of all investment expenses. “Average Investment Fees” mean 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.



By Plan Type

The investment profile of single employer pension plans (SEPPs) and multi employer pension plans (MEPPs) is given below. Table 5.7 shows the asset mix and average performance returns, while Table 5.8 provides the percentile performance returns.

Table 5.7 – Investment Results by Plan Type

Plan Type		SEPP	MEPP	All Plans
# of Plans		1,196	71	1,267
Asset Mix	Fixed Income	47.6%	35.6%	45.7%
	Non-Fixed Income	52.4%	64.4%	54.3%
Performance	Average Return ¹¹	5.02%	5.14%	5.03%
	Average Investment Fees	0.47%	0.46%	0.46%

Table 5.8 – Performance Result Percentiles by Plan Type

Plan Type	SEPP	MEPP	All Plans
Investment Returns			
90 th Percentile	8.21%	7.90%	8.20%
75 th Percentile	6.55%	6.53%	6.55%
Median	5.00%	4.80%	4.98%
25 th Percentile	3.46%	3.66%	3.46%
10 th Percentile	1.57%	2.33%	1.62%
Investment Fees			
90 th Percentile	0.88%	0.63%	0.86%
75 th Percentile	0.60%	0.51%	0.59%
Median	0.41%	0.43%	0.41%
25 th Percentile	0.25%	0.37%	0.25%
10 th Percentile	0.11%	0.28%	0.12%

¹¹ The average return in this table and those in Tables 5.9-5.12 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 pension funds is 6.19 %, compared to 5.03% on an equally weighted basis as shown in this table.



By Benefit Type

Table 5.9 provides the investment profile of pension plans with various benefit types.

Table 5.9 – Investment Results by Benefit Type¹²

Benefit Type		FAE	CAE	FB	Hybrid	Other	All Plans
# of Plans		336	104	208	524	95	1,267
Asset Mix	Fixed Income	38.8%	41.6%	44.0%	51.7%	55.6%	45.7%
	Non-Fixed Income	61.2%	58.4%	56.0%	48.3%	44.4%	54.3%
Performance	Average Return	5.06%	4.45%	4.91%	5.10%	5.41%	5.03%
	Average Investment Fees	0.47%	0.47%	0.48%	0.45%	0.47%	0.46%

By Plan Size

Table 5.10 shows the investment profile of pension funds of various sizes.

Table 5.10 - Investment Results by Asset Size

Size of Plan Assets		Under \$10M	\$10M to \$100M	\$100M to \$1B	Over \$1B	All Plans
# of Plans		390	573	265	39	1,267
Asset Mix	Fixed Income	46.9%	47.7%	46.6%	44.6%	45.7%
	Non-Fixed Income	53.1%	52.3%	53.4%	55.4%	54.3%
Performance	Average Return	4.31%	5.21%	5.52%	6.22%	5.03%
	Average Investment Fees	0.67%	0.40%	0.32%	0.35%	0.46%

¹² MEPPs are included in the various benefit type categories to which they belong.



By Solvency Ratio

Table 5.11 provides the investment profile of pension plans with various solvency ratios.

Table 5.11 – Investment Results by Solvency Ratio (SR)

Solvency Ratio (SR)		SR < 0.85	$0.85 \leq \text{SR} < 1.0$	SR \geq 1.0	All Plans
# of Plans		237	693	337	1,267
Asset Mix	Fixed Income	41.7%	48.1%	45.9%	45.7%
	Non-Fixed Income	58.3%	51.9%	54.1%	54.3%
Performance	Average Return	4.72%	4.98%	5.33%	5.03%
	Average Investment Fees	0.48%	0.47%	0.43%	0.46%

By Percentages Invested in Investment Funds

Table 5.12 shows the investment profile of pension plans with various percentage ranges of assets invested in investment funds.

Table 5.12 – Investment Results by Percentage Invested in Investment Funds

Percentage Invested in Investment Funds		< 20%	20% to 80%	> 80%	All Plans
# of Plans		161	216	890	1,267
Asset Mix	Fixed Income	51.0%	39.6%	46.3%	45.7%
	Non-Fixed Income	49.0%	60.4%	53.7%	54.3%
Performance	Average Return	4.56%	5.47%	5.00%	5.03%
	Average Investment Fees	0.39%	0.36%	0.51%	0.46%



5.3 INVESTMENT OBSERVATIONS

This section presents some key observations about the analyses set out in sections 5.1 and 5.2. The focus is on those findings that are relatively common or show some kind of trend over time:

- Larger plans have higher average return and lower investment fees than small plans.
- Pension funds of MEPPs generally invested more in non-fixed income assets.
- While the typical asset allocation of pension funds between fixed income and non-fixed income did not change significantly, the allocation in alternative investments increased consistently.
- Overall, there do not seem to be significant differences in asset mix, average return and average investment fees between different benefit types.



6.0 2016 PROJECTIONS

6.1 ESTIMATED DB FUNDING CONTRIBUTIONS IN 2016

Table 6.1 presents the estimated funding contributions – comprising normal costs and special payments – expected to be made in respect of DB plans in 2016, including those related to defined benefit provisions under hybrid plans. Estimates are based on information from the most recently filed reports with valuation dates between July 1, 2013 and June 30, 2016.¹³

Table 6.1 - Estimated DB Funding in 2016

	Plans with Solvency Excess	Plans with Solvency Deficit	All Plans
	(\$ Millions)	(\$ Millions)	(\$ Millions)
Number of Plans	364	969	1,333
Employer Normal Cost Contributions	678	2,768	3,446
Member Required Contributions	157	650	807
Sub-total	835	3,418	4,253
Special Payments	112	3,382	3,494
Total	947	6,800	7,747

The total DB funding contributions in 2016 are estimated to be \$7.7 billion, which is 3% lower than the estimated contributions of \$7.9 billion for 2015, as set out in the [2015 Report](#). The \$113 million decrease consists of:

- a \$136 million decrease in the required special payments; and
- a \$23 million increase in the required employer normal cost and member contributions.

The \$3.5 billion in special payments represents 45% of the total estimated 2016 funding contributions of \$7.7 billion.

The table also provides a breakdown of the estimated funding contributions between plans with a solvency excess and plans with a solvency deficit. The total special payments of \$112 million for plans with a solvency excess represent 12% of the total contributions of \$947 million for these plans. This

¹³ For plans where the AIS reported contributions did not extend to the end of 2016, the 2016 estimated contributions were determined assuming contributions would continue at the same rate as that reported for the valuation period.



compares with the total special payments of \$3.4 billion for plans with a solvency deficit, representing about 50% of the total contributions of \$6.8 billion for these plans.

The estimated 2016 funding contributions are determined without considering the existence of a prior-year credit balance or funding excess, which can be used to reduce required contributions during the valuation period. A total of \$1.3 billion of prior-year credit balances were reported for 214 plans with a non-zero prior year credit balance.

6.2 PROJECTED SOLVENCY POSITION AS AT DECEMBER 31, 2016

This section presents a projection of the solvency funding position of DB plans to the end of 2016. The projection reflects the impact of investment returns, changes in the solvency interest rates and the special payments expected to be made during 2016. The methodology and assumptions used are described below.

Methodology and Assumptions

The results reported in the last filed valuation reports (i.e., assets and liabilities) were projected to December 31, 2016 to reflect investment returns and the changes in the solvency valuation bases. These projections were based on the following assumptions:

- Sponsors would use all available funding excess and prior year credit balance, subject to any statutory restrictions, for contribution holidays.
- Sponsors would make the normal cost contributions and special payments, if required, at the statutory minimum level.
- Amounts of cash outflow would equal the pension amounts payable to retired members as reported in the last filed valuation report. Plan administration costs were not reflected.



The median investment returns of pension funds (Table 6.2) were used to project the market value of assets. The actual investment performance of individual plans was not reflected.

Table 6.2 – Median Pension Fund Returns

Year	Annual Rate of Return ¹⁴
2012	9.4%
2013	14.2%
2014	11.9%
2015	5.4%
2016	8.0%

Table 6.3 – Actuarial Basis for Projected Solvency Liabilities

Valuation Date	Commuted Value Basis ¹⁵	Annuity Purchase Basis ¹⁶
December 31, 2015	Interest: 2.10% for 10 years, 3.70% thereafter Mortality: CPM2014 generational	Interest: 3.13% Mortality: CPM2014 generational
December 31, 2016	Interest: 2.20% for 10 years, 3.50% thereafter Mortality: CPM2014 generational	Interest: 3.11% Mortality: CPM2014 generational

¹⁴ For years 2012 to 2015, the rates are the median investment returns of pension funds provided in the Canadian Institute of Actuaries' *A Report on Canadian Economic Statistics 1924-2015*, dated June 2016. The rate for 2016 is derived from a representative weighted average of the 2016 return on the S&P/TSX index (30%), the MSCI World index (25%), and the FTSE TMX Universe Bond index (45%).

¹⁵ The commuted value basis used for the December 31, 2015 and December 31, 2016 solvency projections in this report is based on the Canadian Institute of Actuaries' Standards of Practice – Practice-Specific Standards for Pension Plans, Section 3500 on Pension Commuted Values, dated June 2010.

¹⁶ The interest rates for annuity purchases as at December 31, 2015 and December 31, 2016 are based on the recommendations set out in the Canadian Institute of Actuaries' Educational Notes (EN) providing guidance for Assumptions for Hypothetical Wind Up and Solvency Valuations.



Projection Results

Table 6.4 presents the distribution of solvency ratios reported in the last filed valuation reports and the distribution of projected solvency ratios (PSRs) derived from the projected assets and liabilities.

Table 6.4 - Distribution of Solvency Ratios

Distribution of Solvency Ratio	As at Last Filed Valuation	PSR as at December 31, 2015	PSR as at December 31, 2016
10 th percentile	77%	72%	78%
25 th percentile	87%	78%	85%
50th percentile	93%	83%	91%
75 th percentile	100%	89%	97%
90 th percentile	107%	96%	104%

As shown in Table 6.4, the median PSR is projected to increase from 83% to 91% between December 31, 2015 and December 31, 2016. In general, the change in the median PSR is the net effect of the following factors:

- assumed pension fund returns in 2016 being higher than the solvency valuation discount rates used at December 31, 2015;
- the extent by which expected contributions made during 2016 were different than the increase in solvency liabilities due to benefit accruals in 2016; and
- the change in the solvency valuation interest rates used to calculate the solvency liabilities as at December 31, 2016.



7.0 GLOSSARY

Actuarial Information Summary (AIS): The AIS is a standardized form, developed jointly by FSCO, the Canada Revenue Agency, Financial and Consumer Affairs Authority of Saskatchewan, and the Régie des rentes du Québec. It is required to be completed by an actuary and filed with FSCO in conjunction with a funding valuation report.

Defined Benefit 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 of employment (typically three or five) 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 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 Hybrid: Pension plans in which members have a frozen defined benefit entitlement, but are accruing future defined contribution benefits.

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.

Funded Ratio: The funded ratio of a plan is the ratio of the plan's assets to the plan's liabilities.

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 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.



Investment Information Summary (IIS): This is a Superintendent approved form; required to be completed by the plan administrator. All defined benefit plans other than designated plans or individual pension plans as defined under the Income Tax Act, are required to file the IIS with FSCO.

Investment Return: The rate of return on the pension fund for the reporting year, net of all investment expenses.

Liability and Asset Valuation Methods: These are the actuarial methods used by actuaries to value the liabilities and assets of a pension plan.

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

Solvency Concerns: A valuation report indicates solvency concerns if any of the following circumstances exist, except for certain plans exempted by the Regulation:

- The employer has elected under subsection 5(18) of the Regulation to exclude plant closure benefits or permanent layoff benefits from the determination of solvency liabilities.
- The ratio of the solvency assets to the solvency liabilities is less than 0.85 for a valuation date on or after December 31, 2012.

Smoothed Market Value: The smoothed market value is determined by using an averaging method that stabilizes short-term fluctuations in the market value of plan assets, normally calculated over a period of not more than five years.

Solvency Ratio or Solvency Funded Ratio: The ratio of the solvency assets to the solvency liabilities of the pension plan.



Acronyms

AIS	Actuarial Information Summary
CAE	Career Average Earnings
DB	Defined Benefit
DC	Defined Contribution
FAE	Final Average Earnings
FB	Flat Benefit
FSCO	Financial Services Commission of Ontario
FR	Funded Ratio
IIS	Investment Information Summary (Form 8)
MEPP	Multi-Employer Pension Plan
PBA	Pension Benefits Act (Ontario)
PSR	Projected Solvency Ratio
SEPP	Single Employer Pension Plan
SR	Solvency Ratio
SOMEPP	Specified Ontario Multi-Employer Pension Plan



8.0 APPENDIX – ADDITIONAL INFORMATION FOR PLANS IN FUNDING DATA ANALYSIS

This appendix provides additional details of the profile of the plans included in the funding data analysis. The data consists of DB pension plans that filed valuation reports with valuation dates between July 1, 2013 and June 30, 2016. Please refer to [Section 2.0 – Funding Data Analysis](#) of this report for details of how the data was compiled.

Table 8.1 shows a reconciliation of the 1,283 plans analyzed in the [2015 Report](#) to the 1,333 plans analyzed in the 2016 Report.



Table 8.1 – Reconciliation of Plans from the [2015 Report](#) to the 2016 Report

Plan Type:	Final Average	Career Average	Flat Benefit	Hybrid	Frozen Hybrid	Frozen DB Plans	MEPP	TOTAL
2015 Report	366	104	174	397	171	0	71	1,283
New plans / Spin-offs	4	3						7
Previously registered outside Ontario								
Change to Non-designated Status								
Filed outstanding report *	2			1	1		3	7
Previously excluded	1				1			2
<u>Change in Benefit Type</u>								
• FAE	4	(2)	(1)	(1)				0
• CAE								
• FB			1	(1)				0
• Hybrid	(1)			3	(2)			0
Frozen DB (excluded from analysis)	(3)	(1)		(3)	3	105		101
Wind up (excluded from analysis)	(11)	(4)	(5)	(1)	(7)			(28)
Change to Designated Status								
Plan merger	(2)	(2)		(2)	(2)			(8)
Registration changed to outside of Ontario	(11)	(4)	(3)	(11)	(7)			(36)
DC conversion					(1)			(1)
Outstanding report					(1)			(1)
Data Correction(s)	3			2	3		(1)	7
2016 Report	352	94	166	384	159	105	73	1,333
* These are plans that were not included in the 2015 Report analysis because they did not file a funding valuation report with a valuation date between July 1, 2012 and June 30, 2015. They have since filed a funding valuation report with a valuation date between July 1, 2013 and June 30, 2016.								



Table 8.2 compares the number of plans analyzed in the current report with the plans analyzed in previous reports.

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

Year	Final Average	Career Average	Flat Benefit	Hybrid	Frozen Hybrid	Frozen DB Plans	MEPP	Total	Total Membership
2016	352	94	166	384	159	105	73	1,333	1,866,565
2015	366	104	174	397	170	n/a	72	1,283	1,835,156
2014	384	112	188	386	168	n/a	73	1,311	1,833,773
2013	425	132	202	391	135	n/a	76	1,361	1,860,156
2012	455	140	216	387	113	n/a	76	1,387	1,832,800
2011	491	152	234	381	110	n/a	70	1,438	1,828,604
2010	548	172	262	371	83	n/a	70	1,506	1,866,444
2009	640	197	322	310	n/a	n/a	70	1,539	1,899,155
2008	619	220	338	315	n/a	n/a	72	1,564	1,867,653
2007	663	236	362	292	n/a	n/a	79	1,632	1,880,563
2006	730	271	394	224	n/a	n/a	79	1,698	1,863,433
2005	805	293	424	127	n/a	n/a	73	1,722	1,801,895
2004	839	292	422	86	n/a	n/a	79	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	Non-MEPP	MEPP	Total
0-49	250	0	250
50-99	183	2	185
100-249	287	3	290
250-499	198	4	202
500-999	144	11	155
1000-4999	162	28	190
5000-9999	25	9	34
10000 +	11	16	27
Total	1,260	73	1,333



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	Non-MEPP	MEPP	Total
0-49	6,591	0	6,591
50-99	13,790	173	13,963
100-249	47,095	558	47,653
250-499	71,183	1,469	72,652
500-999	100,482	8,006	108,488
1000-4999	336,069	70,353	406,422
5000-9999	174,447	69,889	244,336
10000 +	195,448	771,012	966,460
Total	945,105	921,460	1,866,565