NOVA SCOTIA RISK SHARING POOL

MARCH 2019 OPERATIONAL REPORT

ACTUARIAL HIGHLIGHTS

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FACILITY Association

ACTUARIAL HIGHLIGHTS

RSP NOVA SCOTIA

OPERATIONAL REPORT

MARCH 2019

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1 Summary

1.1 Valuation Schedule (Fiscal Year 2019)

The March 2019 Operational Report incorporates the results of an updated valuation (as at December 31, 2018) – the impact of the implementation of the valuation is discussed in section 1.2. The table immediately below summarizes the implemented valuations and future scheduled valuations for fiscal year 2019.

NOVA SCOTIA RISK SHARING POOL
FISCAL YEAR 2019 – SCHEDULE OF VALUATIONS

Valuation Date	Discount Rate (per annum)	Operational Report	Description of Changes
Sep. 30, 2018 (completed)	2.28% mfad 25 bp	Oct. 2018	updated valuation (roll forward): accident year 2018 loss ratio decreased 0.7 points to 92.9%; discount rate increased by 42 basis points; no change to selected margins for adverse deviations
Dec. 31, 2018 (completed)	1.93% mfad 25 bp	Mar. 2019	updated valuation: accident year 2019 loss ratio decreased 0.2 points to 96.3%; discount rate decreased by 35 basis points; no change to selected margins for adverse deviations
Mar. 31, 2019		May 2019	update valuation (roll forward)
Jun. 30, 2019		Aug. 2019	update valuation
Sep. 30, 2019		Oct. 2019	update valuation (roll forward)

Under the proposed schedule for fiscal year 2019, the "off-half" valuation quarters ending March 31, 2019 and September 30, 2019 would not reflect a full valuation update of assumptions, but would rather "roll-forward" key assumptions from the previous valuation.

1.2 New Valuation

A valuation of the Nova Scotia Risk Sharing Pool ("RSP") as at December 31, 2018 has been completed since last month's Operational Report and the results of that valuation have been incorporated into this month's Report. The valuation was completed by the Facility Association's internal actuarial group in conjunction with, and approved by, the Appointed Actuary, under the hybrid model for actuarial services. Additional detail will be provided in an "Actuarial Highlights – Quarterly Valuation" report which we anticipate will be posted to the FA website later in June.

The valuation implementation impact is summarized in the tables on the next page.

Summary of Impact ($000s) of Implementing Result of Valuation as at December 31, 2018[1]

NS	unfav / (fav) for the month and ytd					
	IMPACT in $000s from changes in:					
	ults & payout patterns			dsct rate	margins	
	Nominal [1]	apv adj. [2]	sub-tot [3]	apv adj. [4]	apv adj. [5]	TOTAL [6]
PAYs	(825)	19	(806)	317	-	(489)
CAY	(15)	(6)	(21)	64	-	43
Prem Def	(29)	(15)	(44)	123	-	79
TOTAL	(869)	(2)	(871)	504	-	(367)

As indicated in the table above, the incorporation of the new valuation had an estimated ***$0.4 million favourable impact*** on the month's net result from operations, subtracting an estimated 5.1 points (see table below) to the **year-to-date Combined Operating Ratio** to end at **124.0%**.

Summary of Impact (% YTD EP) of Implementing Result of Valuation as at December 31, 2018

NS	ytd EP 7,263 (actual)					
	IMPACT unfav / (fav) as % ytd EP from changes in:					
	ults & payout patterns			dsct rate	margins	
	Nominal [1]	apv adj. [2]	sub-tot [3]	apv adj. [4]	apv adj. [5]	TOTAL [6]
PAYs	(11.4%)	0.3%	(11.1%)	4.4%	-	(6.7%)
CAY	(0.2%)	(0.1%)	(0.3%)	0.9%	-	0.6%
Prem Def	(0.4%)	(0.2%)	(0.6%)	1.7%	-	1.1%
TOTAL	(12.0%)	-	(12.0%)	6.9%	-	(5.1%)

The impact of the nominal changes is shown in column [1] of the two preceding summary tables. The change in the selected nominal ultimates was favourable by $0.9 million overall. This reflects the impact attributable to the changes in the selected ultimate loss ratios (i.e. for each accident year, it is the product of life-to-date earned premium for the accident year and the change in the selected ultimate loss ratio).

The prior accident years overall showed a $0.8 million favourable nominal variance, which is attributed to process variance. This overall favourable prior accident years change is 2.0% of the prior accident years' nominal unpaid balance of $41.4 million determined at the end of last month (February 2019). As a smaller pool, it is subject to higher levels of process variance, driving volatility in the ultimate selection.

The current accident year and premium deficiency impacts are a result of the changes in the selected loss ratios for accident year **2019** (down 0.2 points to **96.3%**) and reflecting **2020** (down 0.3 points to

[1]In these tables, "PAYs" refers to prior accident years, "CAY" refers to the current accident year, and "Prem Def" refers to the provision for premium deficiency or the deferred policy acquisition asset (as applicable). "Nominal" refers to changes excluding any actuarial present value adjustments, whereas "apv adj." refers to actuarial present value adjustments.

The columns under the heading "ults & payout patterns" reflect the impact of changes in the valuation selected ultimates and claims payment patterns (i.e. based on unchanged selection of discount rates and margins for adverse deviation). The column "dsct rate" reflects the impact of the change in the selected discount rate and the column "margins" reflects the impact of any changes in selected margins for adverse deviations.

99.2%). Generally, as a smaller pool, we would expect more volatility around projections of current and future expected loss ratios.

The impacts related to actuarial present value ("apv") adjustments are split into the impact prior to any change in the selected discount rate and selected margins for adverse deviations or "MfADs" (at the level they were selected i.e. coverage and accident half-year), the impact of then updating the discount rate, and finally the impact of any changes to the MfADs (at the level they were selected). The changes in actuarial present value adjustments are shown in the summary tables in columns [2], [4], and [5].

Column [2] recognizes that changing the nominal selections also changed the unpaid estimates (including changes to the relative mix by government line, which had an impact on the weighted-average MfADs). It also reflects the fact that we updated the projected emergence of claims payments, resulting in a change in the projected cash flows. These changes generated a favourable change of $2 thousand in the actuarial present value adjustments, prior to any changes in the selected discount rate and/or MfADs.

Updated projected cash flows were reviewed against the selected risk-free yield curve, derived from Government of Canada benchmark bond yields monthly series using values for December 2018. Column [4] accounts for the change in the **discount rate** selected (decreased 35 basis point to **1.93%**), indicating an unfavourable impact of $0.5 million. The impact *related only to claims liabilities* (i.e. PAYs plus CAY) was $0.4 million at March 2019 – this compares to the $0.4 million change one would estimate as the impact by interpolation using the interest rate sensitivity table provided in last month's Actuarial Highlights.

Column [5] accounts for any changes to selected MfADs. The selected **investment rate MfAD** was **left unchanged at 25 basis points** and the selected **claims development MfADs** at the coverage and accident year level were **left unchanged** as well.

Consideration was given to recent legal decisions and changes in legislation / regulation as outlined in section 1.4.

1.3 Appointed Actuary and Hybrid Actuarial Services Model

Liam McFarlane of Ernst & Young LLP is Facility Association's Appointed Actuary (effective as of June 1, 2013).

Facility Association operates under a "hybrid" model in relation to the management and provision of actuarial services. Under this model, actuarial services are performed by both Facility Association's internal staff and its external actuarial consulting firm. The hybrid model approach maximizes the efficiency of resource allocation while providing access to additional expertise and capacity as needed.

1.4 Consideration of Recent Legal Decisions and Changes in Legislation / Regulation[2]

Discussion related to the Supreme Court of Canada Saadati v Moorhead decision (2017 SCC 28, rendered on June 2, 2017) was removed as at this point we do not believe this judgment will have a further impact on our valuation results.

Consideration and assessment of potential impacts of legal decisions and changes in legislation /

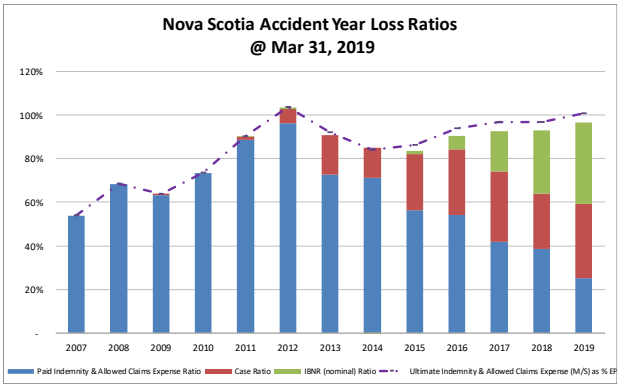
[2]This link is to a helpful guide on how bills become laws: http://www.ontla.on.ca/lao/en/media/laointernet/pdf/bills-and-lawmaking-background-documents/how-bills-become-law-en.pdf.

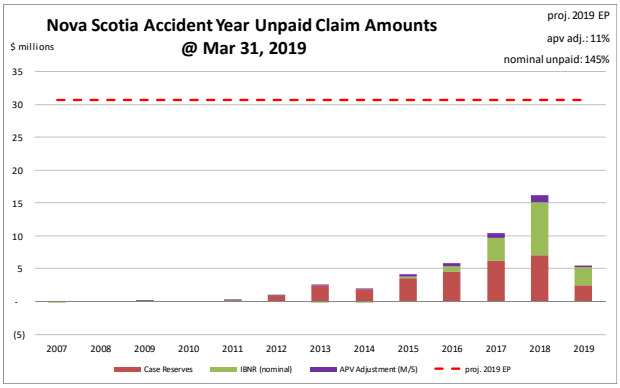
regulation constitutes a regular part of the valuation process. Descriptions of some of the more recent changes are provided below.

The **Nova Scotia Court of Appeal** confirmed, in a unanimous decision released on **January 18, 2019** in relation to **Sparks v Holland** (**2019 NSCA 3**), that future Canada Pension Plan (CPP) disability benefits are deductible from future income loss awards in motor-vehicle accident claims in that province. Sparks sustained injuries as a result of a motor vehicle accident in Nova Scotia and sought damages for personal injuries and loss of income. The decision supported an earlier decision (Tibbets v Murphy, 2017 NSCA 35) that both past and future CPP disability benefits are deductible under section 133A of the Insurance Act. At the current time, no adjustments have been made to our valuation estimates as a result of this decision.

1.5 Current Provision Summary

The charts immediately below show the current levels of claim liabilities[3] booked by accident year. The left chart displays life-to-date payments, case reserves, IBNR, and the total including actuarial present value adjustments against accident year earned premium. The right chart shows the associated dollar amounts for the components of the claim liabilities and the current projected amount of 2019 full year earned premium (the red hash-mark line) to provide some perspective.





"M/S" refers to "Member Statement" values – that is, actuarial present value adjustments at the selected discount rate.

The current actuarial present value adjustments balance ($3.4 million – see table immediately below) represents 11% of the earned premium projected for the full year 2019 (see the upper right corner of the right chart above), with the increase in the actuarial present value adjustments from last month a result of the 2018 Q4 valuation implementation, specifically the decrease in the discount rate. If our current estimates of the nominal unpaid amounts prove to match actual claims payments, the actuarial present value adjustments will be released into the net operating result over future periods.

claim liabilities ($000s)

	amt	%
case	29,097	60.9%
ibnr	15,327	32.1%
M/S apv adjust.	3,376	7.1%
M/S total	47,800	100.0%

The table to the left breaks down the Member Statement (M/S) claim liabilities total into component parts, showing that the majority of the claim liabilities for this RSP is in case reserves. Approximately 70% of the IBNR balance relates to accident years 2018 and 2019 (see Exhibit B).

[3]Claim liabilities refer to provision for unpaid indemnity and allowed claims expenses. Allowed claims expenses are first party legal and other expenses as listed in the RSP Claims Guide. Claims expenses paid through the member company expense allowance are NOT included in this discussion.

Approximately 88% of the M/S total claim liabilities are related to accident years 2015-2019 inclusive (i.e. the most recent 5 accident years) and less than 1% is related to accident years 2009 and prior (i.e. prior to the most recent 10 accident years).

The tables immediately below summarize the premium liabilities and the total policy liabilities.

premium liabilities ($000s)

	amt	%
unearned prem	14,526	96.7%
prem def/(dpac)	(281)	(1.9%)
M/S apv adjust.	775	5.2%
M/S total	15,020	100.0%

policy liabilities ($000s)

	amt	%
claim	44,424	70.7%
premium	14,245	22.7%
M/S apv adjust.	4,151	6.6%
M/S total	62,820	100.0%

2 Activity During the Month of March 2019

2.1 Recorded Premium and Claims Activity

The table immediately below summarizes the extent to which premiums and claims amounts recorded during the month differ from projections reflected in the prior month's Operational Report[4].

Nova Scotia RSP Actual vs Projected Summary: Recorded Transaction Amounts ($ thousands)

Table 01	Earned Premium		Paid Indemnity & Allowed Claims Expense		Case increase / (decrease)		Recorded increase / (decrease)	
Accident Year	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
Prior	(0)	(0)	844	639	(478)	(298)	366	341
2017	(3)	(3)	145	46	22	83	166	128
2018	(7)	(7)	389	80	(417)	(188)	(28)	(108)
2019	2,532	(16)	1,079	376	557	(239)	1,636	137
TOTAL	2,522	(26)	2,456	1,140	(316)	(642)	2,140	498

(Recorded transaction amounts exclude IBNR & other actuarial provisions)

Claims transaction activity is generally volatile and changes from one month to the next are anticipated due to this natural "process variance" (i.e. random variation), and this is particularly true where volumes are low as found in this RSP. Each month, the projection variances are reviewed for signs of projection bias and to identify potential ways to reduce the level of the variance. Commentary from our review is provided in the sub-sections that follow.

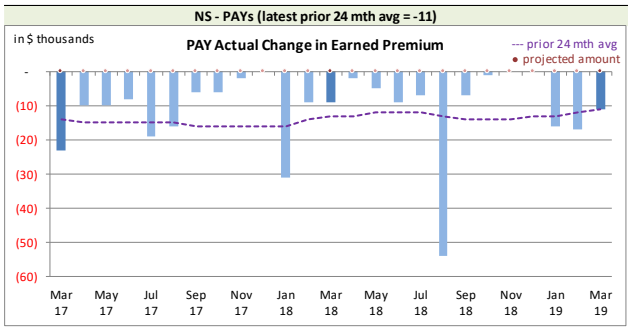
2.1.a Actual vs. Projected (AvsP): Earned Premium

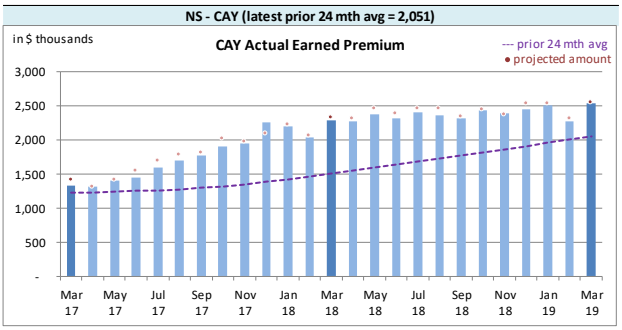
The charts at the top of the next page show actual **earned premium**[5] activity in each of the most recent 25 calendar months, along with a "prior 24-month average" to show how each month's actual compares with the average amount of the preceding 24 calendar months.

[4]There may be rounding differences in values in this document compared with the associated Bulletin and/or Operational Report.

[5]Premium is earned on a daily basis based on the transaction term measured in days. As a result, months with 31 days earned relatively more than those with 30 days, and February earns the least.

Nova Scotia RSP Actual **Earned Premium** by Calendar Month

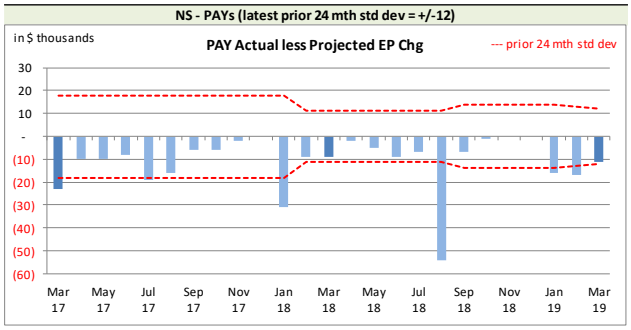


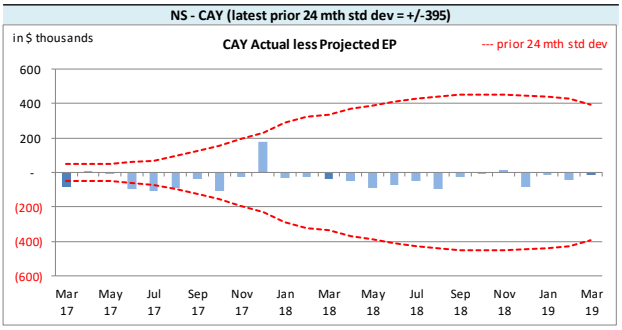


Earned premium changes during a given calendar month in relation to prior accident years tend to be at modest levels, although relatively high levels generally occur at the beginning of each year.

The associated variance between the actual changes and the projections from the previous month are shown in the charts immediately below. **Earned premium** change projections are all attributed to the current accident year as the projection upload does not accept **earned premium** changes for other accident years. We do not see this limitation as being significant for our purposes, but it does mean that the actual less projection variance will equal the actual **earned premium** change in relation to prior accident years.

Nova Scotia RSP Actual vs. Projected Summary: ***Earned Premium*** *Variances by Calendar Month*





On Latest $ thousands		
Earned Premium	PAYs	CAY
Mthly Avg EP Chg (prior 24 mths)	(11)	2,051
std dev	12	395
A-P <> std dev	6	3
% <> std dev	24.0%	12.0%
norm <> std dev	31.7%	31.7%

We project **earned premium** changes from known unearned premium and projected written premium levels, but upload the total projections as current accident year (CAY). This process has generated prior accident years' (PAYs) bias[6], with actuals generally lower than projected, although the magnitude is not high relative to monthly premium. In addition to the PAYs' bias, the CAY has also shown bias[7], with actuals being generally lower than projected, and we have modified our projections processes in response. Over time, we may consider other projection approaches to narrow monthly variance levels further, but it is not currently

[6]The PAYs' variances will show bias as the projection upload forces all earned premium projections to be attributed to the CAY.

[7]We measure bias based on a 95% confidence range for a binominal distribution with trials based on the range being considered (24 in this case) and 50% probability of success. The 24-month variances at March 2019 has only 3 months where the actuals were higher than projected, and as the 95% confidence range is 7 to 17, bias continues to be indicated.

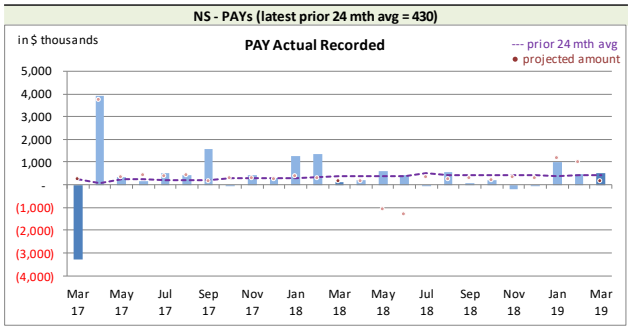
deemed a priority.

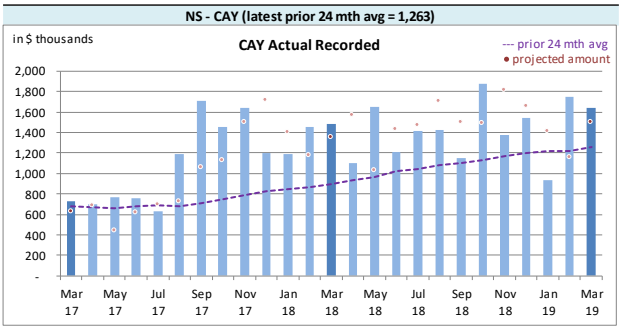
Readers will note the significant widening of the CAY standard deviation band, reflecting volume increases and the impact as those increases are earned.

2.1.b AvsP: Recorded Indemnity & Allowed Claims Expense

The charts immediately below show actual **recorded** activity (**paid** and case reserve changes), in each of the most recent 25 calendar months, along with a "prior 24-month average" to show how each month's actual compares with the average amount of the preceding 24 calendar months.

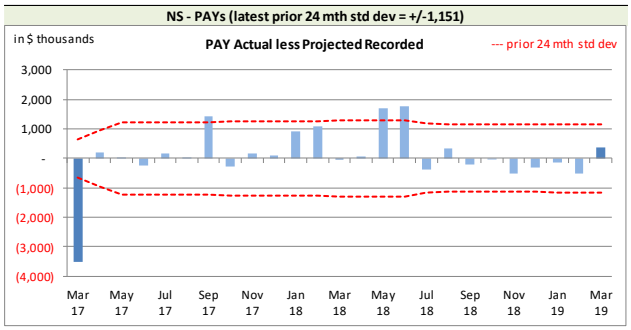
*Nova Scotia RSP Actual **Recorded** by Calendar Month*

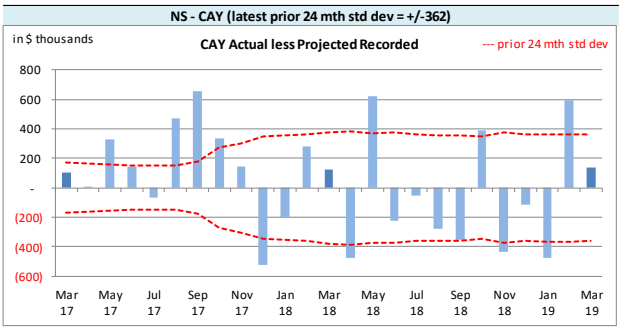




Recorded activity variances from the previous month's projections are shown in the charts immediately below, including the "prior 24-month standard deviation" levels to show how the variances from projection compare with historical standard deviations.

*Nova Scotia RSP Actual vs Projected Summary: **Recorded** Variances by Calendar Month*





On Latest $ thousands		
Recorded	PAYs	CAY
Mthly Avg Recorded (prior 24 mths)	430	1,263
std dev	1,151	362
A-P <> std dev	4	11
% <> std dev	16.0%	44.0%
norm <> std dev	31.7%	31.7%

With respect to **recorded** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look unusual and generate relatively significant variances that in nominal value terms are not that significant in relative or overall terms. That said, 16% of prior accident years' (PAYs) **recorded** variances over the last 25 calendar months have fallen outside of one standard deviation of the actual **recorded** amounts (see table above), suggesting the projection process has performed better than simply projecting the prior 24-month average amount (assuming it follows a normal distribution). Bias has not been

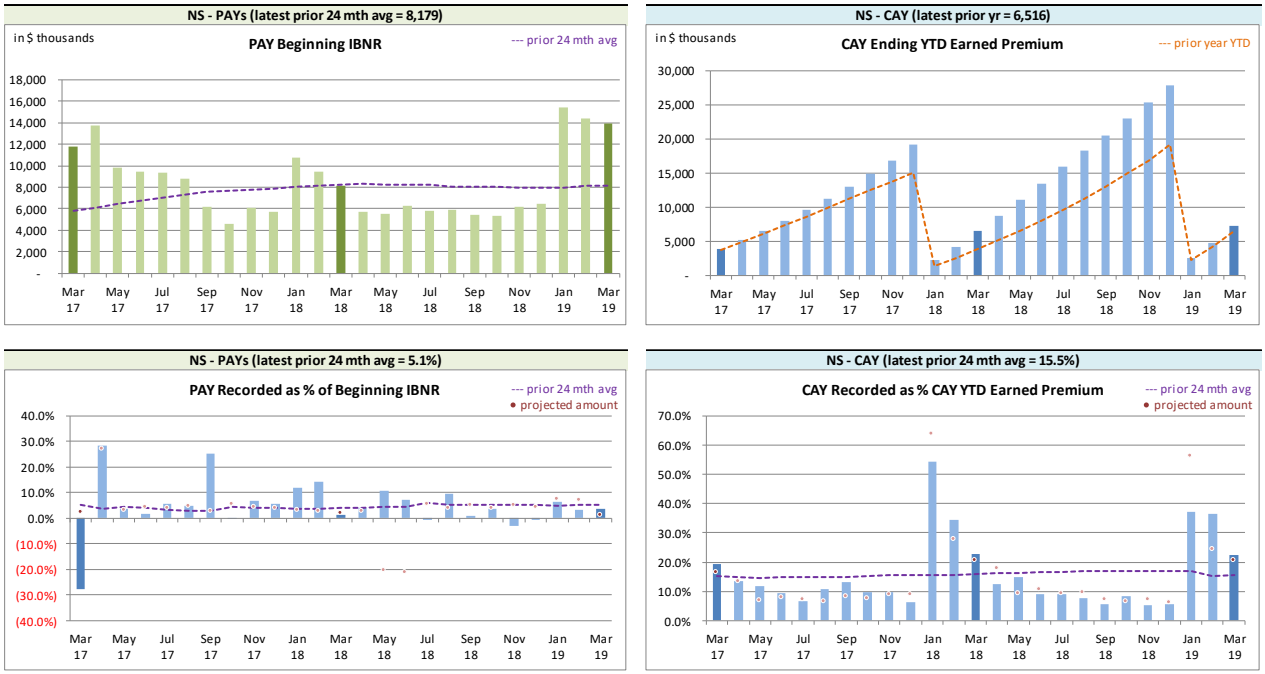
indicated at a 95% confidence level on a lagging 24-month basis.

The current accident year (CAY) **recorded** variances fell outside of one standard deviation 44% of the time over the last 25 calendar months (see table above), suggesting that the projection process has performed worse than simply projecting the prior 24-month average amount. We are considering ways to improve our projection process as a result, but efforts so far have fallen short (although rapid growth may be hampering our projection capabilities). Bias has not been indicated at a 95% confidence level on a lagging 24-month basis.

The method for establishing IBNR adjusts automatically for changes in **earned premium** and **recorded** claims activity level (see sections 2.2 and 3).

We have included, for reference, additional charts immediately below related to levels influencing **recorded** activity. Note in particular the increase in the level of PAYs beginning IBNR. Part of this will be as a response to valuations and showing up as a beginning IBNR change one month after the valuation is implemented (i.e. April, June, September, and November), and part will also reflect the maturity level of the RSP.

Nova Scotia RSP Levels that influence[8] ***Recorded*** *activity by Calendar Month*



We track beginning prior accident years' IBNR as **recorded** activity "comes out of" IBNR. Changes in the prior accident years' beginning IBNR (see left chart above) occur for several possible reasons:

- to offset actual **recorded** activity (through loss ratio matching);

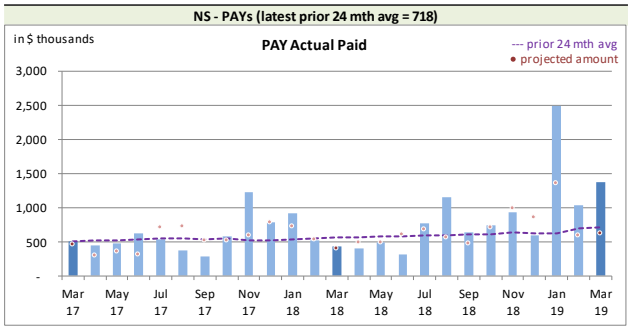
[8]Our recorded activity projections for the prior accident years are based on selected ratios of recorded activity to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date IBNR to year-to-date selected ultimate (i.e. selected LR x earned premium), deriving year-to-date recorded as selected ultimate less IBNR. In both cases, the ratio selection is based on our review of the more recent recorded activity and recent AvsP analyses.

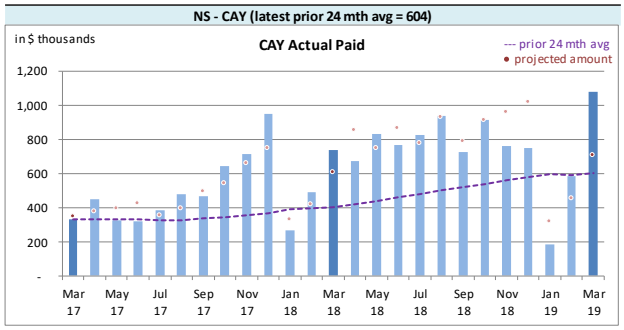
- the annual switchover as a current accident year becomes a prior accident year (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of prior accident years' ultimate (will show up as a beginning IBNR change one month after the valuation is implemented, i.e. the change will generally show in April, June, September, and November).

2.1.c AvsP: Paid Indemnity & Allowed Claims Expense

The charts immediately below show actual **paid** activity in each of the most recent 25 calendar months, along with a "prior 24-month average" to show how each month's actual compares with the average amount of the preceding 24 calendar months.

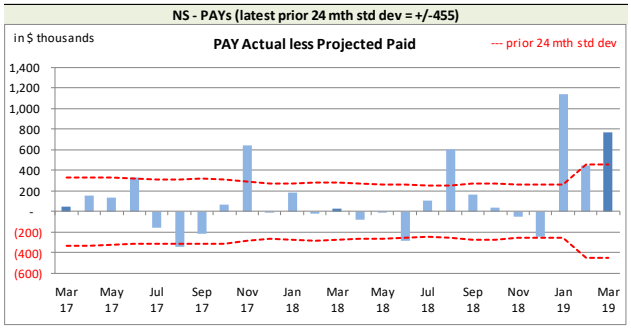
*Nova Scotia RSP Actual **Paid** by activity Calendar Month*

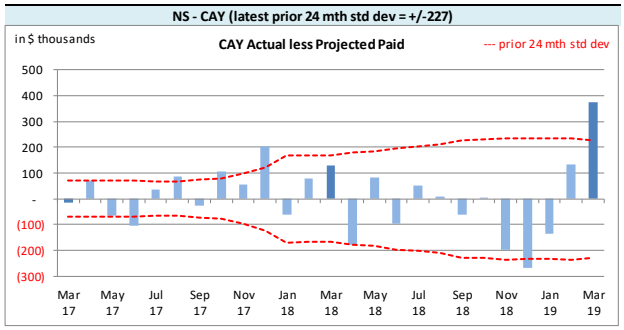




Paid activity variances from the previous month's projections are shown in the charts immediately below, including the "prior 24-month standard deviation" levels to show how the variances from projection compare with historical standard deviations.

*Nova Scotia RSP Actual vs Projected Summary: **Paid** Variances by Calendar Month*





On Latest $ thousands		
Paid	PAYs	CAY
Mthly Avg Paid (prior 24 mths)	718	604
std dev	455	227
A-P <> std dev	7	7
% <> std dev	28.0%	28.0%
norm <> std dev	31.7%	31.7%

With respect to **paid** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look unusual and generate relatively significant variances that in nominal value terms are not that significant in relative or overall terms. That said, 28% of the prior accident years' (PAYs) variances over the last 25 calendar

months have fallen outside of one standard deviation of the actual **paid** amounts (see table on left above), suggesting the projection process has performed no better than simply projecting the prior 24-month average amount (assuming it follows a normal distribution). Bias has not been indicated at a 95% confidence level on a lagging 24-month basis.

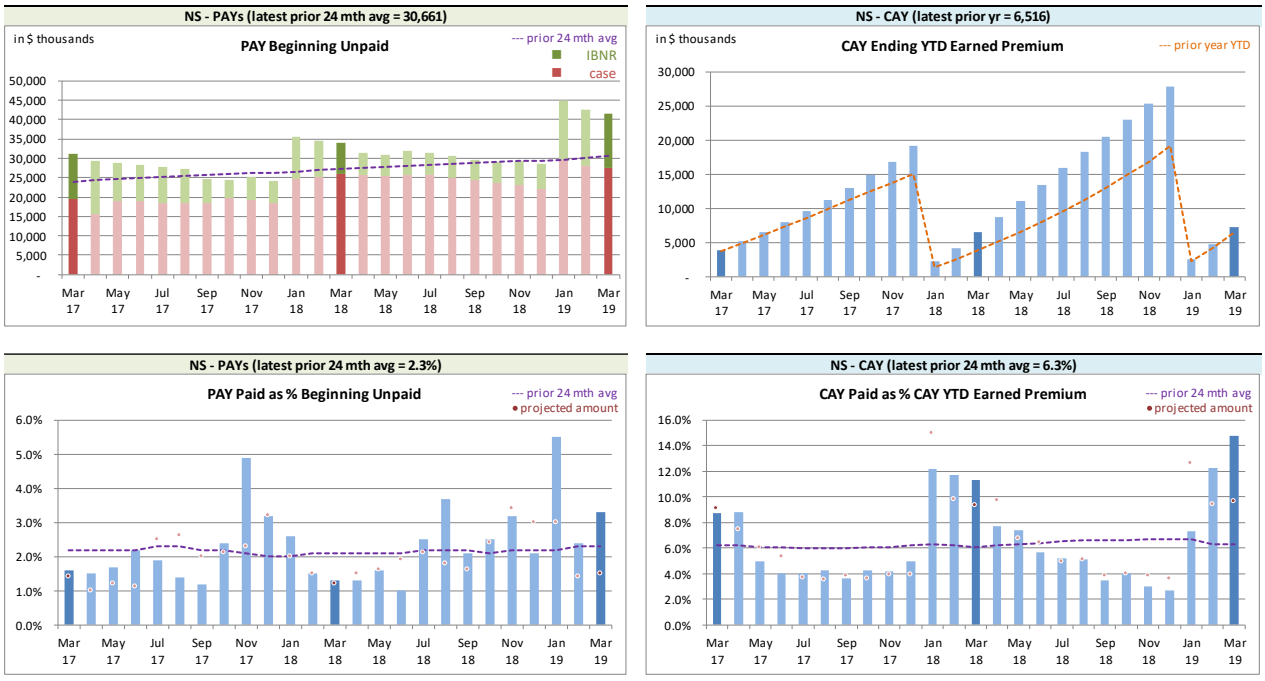
The PAYs **paid** variance (see left chart at the bottom of the previous page) was outside of one standard deviation this month. The activity was reviewed and confirmed, with the variance attributed to process variance (1 large claim settlement for each of PAYs 2015 and 2016 that were matched with reserve take downs).

The current accident year (CAY) **paid** variances fell outside of one standard deviation 28% of the time over the last 25 calendar months (see table at the bottom of the previous page), suggesting that the projection process has performed no better than simply projecting the prior 24-month average amount. No bias has been indicated at a 95% confidence level on a lagging 24-month basis.

The CAY **paid** variance (see right chart at the bottom of the previous page) was outside of one standard deviation this month. The activity was reviewed and confirmed, with the variance attributed to process variance.

We have included, for reference, additional charts immediately below related to levels influencing **paid** activity. Both case and IBNR increases contribute to the increase of PAYs beginning unpaid. This is somewhat expected, given the maturity level of the RSP.

Nova Scotia RSP Levels that influence[9] ***Paid*** *activity by Calendar Month*



[9]Our paid projections for the prior accident years are based on selected ratios of paid to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date paid to year-to-date selected ultimate indemnity (i.e. selected LR x earned premium). In both cases, the ratio selection is based on our review of the more recent recorded activity and recent AvsP analyses.

We track beginning prior accident years' unpaid balance (case and IBNR) as **paid** activity "comes out of" the unpaid balance. Changes in the prior accident years' beginning unpaid balance (see upper left chart above) occur for several possible reasons:

- to offset actual **paid** activity (may reduce case or IBNR or both);
- the annual switchover as a current accident year becomes a prior accident year (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of prior accident years' ultimate (will show up as a beginning unpaid balance change one month after the valuation is implemented, i.e. the change will generally show in April, June, September, and November).

2.2 Actuarial Provisions

An "ultimate loss ratio matching method" (described in section 3) was used to determine the month's IBNR[10], and factors were applied to the nominal unpaid claims liability (case plus IBNR) to determine the discount amount (shown as a negative value to indicate its impact of reducing the liability) and the Provisions for Adverse Deviations. The loss ratios and the factors used to determine the current month's provisions and projections were based on the applicable valuation. The table immediately below summarizes variances in provisions included in this month's Operational Report and the associated one-month projections from last month's Report.

Nova Scotia RSP Actual vs Projected Summary: IBNR and APV Amounts ($ thousands)

Table 02

			actuarial present value adjustments					
	IBNR		Discount Amount		Provisions for Adverse Deviations		IBNR + actuarial present value adjustments	
Accident Year	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
Prior	1,027	(1,137)	(450)	133	1,663	(153)	2,240	(1,157)
2017	3,529	(188)	(416)	83	1,177	(4)	4,290	(109)
2018	8,055	130	(769)	169	1,849	40	9,135	339
2019	2,716	(167)	(306)	75	628	(37)	3,038	(129)
TOTAL	15,327	(1,362)	(1,941)	460	5,317	(154)	18,703	(1,056)

The IBNR provision is $1.4 million lower than projected from last month, counterbalancing the recorded claims activity and adjusting for the earned premium variance impacts indicated in section 2.1, and due to the valuation implementation.

Exhibit G shows the accident year IBNR amount change from last month to this month broken down into:

(i) the change projected last month;

(ii) the additional change due to variances in earned premium (because we apply a loss ratio to earned premium in determining ultimate level) and/or recorded claims (as IBNR is calculated as ultimate less recorded) differences; and

[10]For ease of discussion, "IBNR" is used in place of "provisions for incurred but not recorded (IBNR) and development".

(iii) the additional change due to valuation implementation impacts (as applicable)

The variances associated with (ii) above are discussed in sections 2.1.a and 2.1.b.

The table immediately below summarizes the variances in the provisions for premium deficiency liability / (deferred policy acquisition cost asset) included this month's Operational Report and the one-month projections from last month's Report. This RSP is in a deferred policy acquisition cost asset position (shown as a negative value) prior to actuarial present value adjustments and in a premium deficiency position (shown as a positive value) after actuarial present value adjustments. Actuarial present value adjustments increase the liability value as the adjustments increase the expected future policy obligations (costs) associated with the unearned premium. The variances noted are mainly driven by the unearned premium variance, and due to the valuation implementation.

Nova Scotia RSP Actual vs Projected Summary: Premium Deficiency / (DPAC) Amounts ($ thousands)

Table 03

	Premium Deficiency / (Deferred Policy Acquisition Costs)		actuarial present value adjustments		Premium Deficiency / (DPAC) including actuarial present value adjustments	
	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
balance:	(281)	(31)	775	110	494	79
balance as % unearned premium:	(1.9%)	(0.2%)	5.3%	0.7%	3.4%	0.5%
actual unearned premium:	14,526					
less projected:	65					

3 Ultimate Loss Ratio Matching Method

An "ultimate loss ratio matching method" continues to be applied to the current month and two projected months shown in the Operational Reports, with IBNR determined by accident year as follows:

(a) Earned premium to-date
(b) Ultimate loss[11] ratio per latest valuation
(c) Estimated ultimate incurred = (a) x (b)
(d) Recorded indemnity & allowed claims expense to-date
(e) IBNR = (c) – (d)

4 Calendar Year-to-Date Results

The table at the top of the next page summarizes the calendar year-to-date results for indemnity & allowed claims expenses[12], including IBNR.

In calculating the amounts as percentages of earned premium, the calendar year-to-date earned premium has been used, which includes not only the earned premium associated with the current accident year, but also earned premium adjustments related to prior accident years. Specifically, the

[11]"Loss" here refers to indemnity and allowed claims expenses, but does not include the claims expense allowance included in member company overall expense allowances ("Expense Allowance" in the Operational Report).

[12]Allowed claims expenses are first party legal and other expenses as listed in the RSP Claims Guide. Claims expenses paid through the member company expense allowance are NOT included in this analysis.

current accident year (CAY) ratio in the table is 96.9% rather than 96.3% (the valuation ultimate ratio for accident year 2019), as the calendar year-to-date earned premium includes prior accident year earned premium adjustments. (Note that the ratios in this table may differ slightly from those shown in the Nova Scotia RSP Summary of Operations due to rounding.)

Nova Scotia RSP Calendar Year-to-Date Indemnity & Allowed Claims Expense Summary ($ thousands)

Table 04	YTD Nominal Values		YTD actuarial present value adjustment		YTD Total		Change from Prior Month YTD	
	Amount	% EP	Amount	% EP	Amount	% EP	Amount	LR pts
PAYs	(865)	(11.9%)	311	4.3%	(554)	(7.6%)	(606)	(8.7%)
CAY	7,036	96.9%	322	4.4%	7,358	101.3%	2,555	-
TOTAL	6,171	85.0%	633	8.7%	6,804	93.7%	1,949	(8.7%)

("% EP" based on 2019 calendar year-to-date earned premium; ratios may not total due to rounding)

In general, prior accident years (PAYs) changes from last month are due to the release of the actuarial present value adjustments with claims payments, except when valuations are implemented. The loss ratio change year-to-date in Table 04 reflects not only changes in the prior accident year levels, but also the increase in the calendar year-to-date earned premium with an additional month's earned premium, and due to the valuation implementation.

For the current accident year (CAY), changes in the year-to-date total reflects the additional month's exposure and regular changes to actuarial present value adjustments as the year ages, and due to the valuation implementation.

5 Current Operational Report – Additional Exhibits

Section 6 provides exhibits pertaining to the actuarial provisions reflected in the current month's Operational Report.

IBNR (including actuarial present value adjustments) presented in section 6, Exhibit A, were derived on a discounted basis, and therefore reflect the time value of money and include an explicit provision for adverse deviations in accordance with accepted actuarial practice in Canada.

IBNR presented in section 6, Exhibit B, does NOT include any actuarial present value adjustments. The "Total IBNR" from this exhibit is shown in the Operational Report as "Undiscounted IBNR".

The ultimate loss ratios detailed in section 6, Exhibit B, refer to the estimates derived on the basis of various actuarial methodologies applied to the experience of the Nova Scotia Risk Sharing Pool for the purposes of the most recent quarterly valuation. As discussed in section 3, IBNR reflected in the current month's Operational Report was derived as the difference between the estimated ultimate for the claims amount (i.e. earned premium x ultimate loss ratio) and the associated current recorded amounts (life-to-date payments plus current case reserves).

6 EXHIBITS

The exhibits listed below are provided on the pages that follow:

EXHIBIT A IBNR for Member Sharing – includes Actuarial Present Value Adjustments

EXHIBIT B IBNR

EXHIBIT C Premium Liabilities

EXHIBIT D Projected Year-end Policy Liabilities

EXHIBIT E Discount Rate & Margins for Adverse Deviations

EXHIBIT F Interest Rate Sensitivity

EXHIBIT G Components of IBNR Change During Month

EXHIBIT A

IBNR for Member Sharing – includes Actuarial Present Value Adjustments

TABLE EXHIBIT A

Amounts in $000s

IBNR + M/S actuarial present value adjustments

discount rate 1.93%

interest rate margin 25 basis pts

Accident Year	Actual Feb. 2019	Actual Mar. 2019	Projected Apr. 2019	Projected May. 2019	Projected Dec. 2019
2007	(1)	(1)	(1)	(1)	(1)
2008	2	2	2	2	2
2009	9	10	10	10	8
2010	-	4	4	4	4
2011	48	48	48	47	40
2012	377	121	120	119	99
2013	326	170	167	166	150
2014	(50)	(95)	(94)	(93)	(63)
2015	824	594	577	573	399
2016	1,902	1,387	1,362	1,294	965
2017	4,444	4,290	4,178	4,066	3,107
2018	8,894	9,135	8,873	8,539	6,601
2019	2,119	3,038	4,041	5,576	11,880
TOTAL	18,894	18,703	19,287	20,302	23,191
Change		(191)	584	1,015	

Please see Exhibit G, page 1 for Components of Change during Current Month

EXHIBIT B

IBNR

TABLE EXHIBIT B — Amounts in $000s

IBNR

Ultimate Loss Ratio	Accident Year	Actual Feb. 2019	Actual Mar. 2019	Projected Apr. 2019	Projected May. 2019	Projected Dec. 2019
53.9%	2007	(1)	(1)	(1)	(1)	(1)
68.3%	2008	2	2	2	2	2
63.8%	2009	5	5	5	5	4
73.4%	2010	-	4	4	4	4
90.2%	2011	35	35	35	35	29
103.3%	2012	305	60	59	58	46
90.6%	2013	174	(5)	(5)	(5)	(4)
83.3%	2014	(167)	(218)	(216)	(214)	(171)
83.6%	2015	410	239	232	230	126
90.5%	2016	1,426	906	897	834	568
92.7%	2017	3,755	3,529	3,423	3,320	2,465
93.0%	2018	8,005	8,055	7,813	7,500	5,691
96.3%	2019	1,923	2,716	3,620	5,045	10,669
	TOTAL	15,872	15,327	15,868	16,813	19,428
	Change		(545)	541	945	

Please see Exhibit G, page 2 for Components of Change during Current Month

EXHIBIT C

Premium Liabilities

TABLE EXHIBIT C — Amounts in $000s

Premium Liabilities	Actual Feb. 2019	Actual Mar. 2019	Projected Apr. 2019	Projected May. 2019	Projected Dec. 2019
(1) unearned premium (UP)	14,585	14,526	14,807	15,117	16,562
FOR MEMBER SHARING					
(2) expected future costs ratio {% of (1)}	102.8%	103.4%	103.6%	103.8%	106.3%
(3) expected future costs {(1) x (2)}	14,987	15,020	15,335	15,687	17,603
(4) premium deficiency / (deferred policy acquisition cost)	402	494	528	570	1,041
Excluding Actuarial Present Value Adjustments					
(5) expected future costs ratio {% of (1)}	98.2%	98.1%	98.2%	98.4%	100.8%
(6) expected future costs {(1) x (5)}	14,317	14,245	14,543	14,877	16,694
(7) premium deficiency / (deferred policy acquisition cost)	(268)	(281)	(264)	(240)	132

EXHIBIT D

Projected Year-end Policy Liabilities

The table below presents the projected policy liabilities as at December 31, 2019, broken down by component.

Nova Scotia	Projected Balances as at Dec. 31, 2019 ($000s)									
ending 2019	nominal values			actuarial present value adjustments (apvs)						
Acc Yr	Case	IBNR	Total Unpaid	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs	TOTAL
2008	-	2	2	-	-	-	-	-	-	2
2009	58	4	62	(2)	-	6	-	6	4	66
2010	-	4	4	-	-	-	-	-	-	4
2011	143	29	172	(6)	1	17	(1)	16	11	183
2012	774	46	820	(29)	3	82	(3)	79	53	873
2013	2,150	(4)	2,146	(64)	9	215	(6)	209	154	2,300
2014	1,583	(171)	1,412	(34)	4	141	(3)	138	108	1,520
2015	2,793	126	2,919	(82)	9	356	(10)	346	273	3,192
2016	3,896	568	4,464	(156)	18	554	(19)	535	397	4,861
2017	5,681	2,465	8,146	(350)	41	994	(43)	951	642	8,788
2018	7,004	5,691	12,695	(647)	76	1,561	(80)	1,481	910	13,605
PAYs (sub-total):	24,082	8,759	32,841	(1,370)	161	3,926	(165)	3,761	2,552	35,393
CAY (2019)	8,891	10,669	19,560	(1,154)	156	2,347	(138)	2,209	1,211	20,771
claims liabilities:	32,973	19,428	52,401	(2,524)	317	6,273	(303)	5,970	3,763	56,164
	Unearned Premium	Premium Deficiency / (DPAC)	Total Provision	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs	TOTAL*
premium liabilities:	16,562	132	16,694	(756)	82	1,659	(76)	1,583	909	17,603
										*Total may not be sum of parts, as apvs apply to future costs within UPR
policy liabilities:			**69,095**	**(3,280)**	**399**	**7,932**	**(379)**	**7,553**	**4,672**	**73,767**

EXHIBIT E

Discount Rate & Margins for Adverse Deviations

The tables below present selected margins for adverse development by coverage (the total is a weighted average, based on the unpaid claims projection for December 31, 2019 from the valuation), followed by the selected discount rate and the associated margin for investment income.

Selected Claims Development MfADs (Dec. 31, 2018)

Accident Year	Third Party Liability	Accident Benefits	Other Coverages	Total
	Margins	Margins	Margins	Margins
2007	10.0%	10.0%	10.0%	10.0%
2008	10.0%	10.0%	10.0%	10.0%
2009	10.0%	10.0%	10.0%	10.0%
2010	10.0%	10.0%	10.0%	10.0%
2011	10.0%	10.0%	10.0%	10.0%
2012	10.0%	10.0%	10.0%	10.0%
2013	10.0%	10.0%	10.0%	10.0%
2014	10.0%	10.0%	9.9%	10.0%
2015	12.5%	10.0%	12.0%	12.2%
2016	12.5%	10.0%	12.5%	12.4%
2017	12.5%	10.0%	9.8%	12.2%
2018	12.5%	10.0%	9.5%	12.3%
2019	12.4%	10.0%	5.8%	12.0%
prem liab	11.9%	10.0%	5.1%	10.1%

discount rate:	1.93%
margin (basis points):	25

EXHIBIT F

Interest Rate Sensitivity

The tables below present sensitivity to the member statement claims liability as projected to Dec. 31, 2019 from the latest valuation date (projections in exhibits A to D are to Dec. 31, 2019, and are based on more up-to-date information). We have included the most recent valuation selection (1.93%), the prior valuation assumption (2.28%) and the prior fiscal year end valuation assumption (2.28%) for comparative purposes. A 25 basis point margin for investment return adverse deviation is used in all scenarios presented.

$ Format: $000s

	Actuarial Present Value of Provisions at Various Discount Rates - Dec. 31, 2019 projected Unpaid							
AY	0.93%	1.43%	1.93%	2.43%	2.93%	3.43%	2.28%	2.28%
2007	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-
2009	44	43	43	43	42	42	43	43
2010	2	2	2	2	2	2	2	2
2011	553	548	543	537	532	527	539	539
2012	660	654	648	642	637	631	644	644
2013	994	987	979	972	965	957	974	974
2014	843	838	833	828	823	818	829	829
2015	3,572	3,546	3,520	3,495	3,470	3,445	3,502	3,502
2016	5,325	5,276	5,228	5,181	5,135	5,089	5,195	5,195
2017	8,800	8,700	8,602	8,505	8,412	8,320	8,534	8,534
2018	15,653	15,439	15,235	15,031	14,835	14,641	15,091	15,091
2019	22,352	22,005	21,667	21,337	21,018	20,705	21,434	21,434
Total	58,798	58,038	57,300	56,573	55,871	55,177	56,787	56,787
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

	Dollar Impact Relative to Valuation Assumption							
AY	0.93%	1.43%	1.93%	2.43%	2.93%	3.43%	2.28%	2.28%
Total	1,498	738	-	(727)	(1,429)	(2,123)	(513)	(513)
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

	Percentage Impact Relative to Valuation Assumption							
AY	0.93%	1.43%	1.93%	2.43%	2.93%	3.43%	2.28%	2.28%
2007	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-
2009	2.3%	-	-	-	(2.3%)	(2.3%)	-	-
2010	-	-	-	-	-	-	-	-
2011	1.8%	0.9%	-	(1.1%)	(2.0%)	(2.9%)	(0.7%)	(0.7%)
2012	1.9%	0.9%	-	(0.9%)	(1.7%)	(2.6%)	(0.6%)	(0.6%)
2013	1.5%	0.8%	-	(0.7%)	(1.4%)	(2.2%)	(0.5%)	(0.5%)
2014	1.2%	0.6%	-	(0.6%)	(1.2%)	(1.8%)	(0.5%)	(0.5%)
2015	1.5%	0.7%	-	(0.7%)	(1.4%)	(2.1%)	(0.5%)	(0.5%)
2016	1.9%	0.9%	-	(0.9%)	(1.8%)	(2.7%)	(0.6%)	(0.6%)
2017	2.3%	1.1%	-	(1.1%)	(2.2%)	(3.3%)	(0.8%)	(0.8%)
2018	2.7%	1.3%	-	(1.3%)	(2.6%)	(3.9%)	(0.9%)	(0.9%)
2019	3.2%	1.6%	-	(1.5%)	(3.0%)	(4.4%)	(1.1%)	(1.1%)
Total	2.6%	1.3%	-	(1.3%)	(2.5%)	(3.7%)	(0.9%)	(0.9%)
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

EXHIBIT G

Components of Member Statement IBNR (i.e. "Discounted") Change During Month

RSP	**Nova Scotia**
AccountCode Desc	**IBNR - Discounted**

M/S IBNR - in $000s

	Values						
AccYear	**Sum of Prior Month Actual Amount**	**Sum of Projected Change**	**Sum of Change Due to AvsP Variances**	**Sum of Change Due to Valuation Implementation**	**Sum of Total Change**	**Sum of % Total Change**	**Sum of Current Month Final Amount**
2007	(1)	-	-	-	-	-	(1)
2008	2	-	-	-	-	-	2
2009	9	-	-	1	1	11.1%	10
2010	-	-	4	-	4	100.0%	4
2011	48	(1)	1	-	-	-	48
2012	377	(7)	11	(260)	(256)	(67.9%)	121
2013	326	(5)	5	(156)	(156)	(47.9%)	170
2014	(50)	3	(41)	(7)	(45)	90.0%	(95)
2015	824	(12)	(155)	(63)	(230)	(27.9%)	594
2016	1,902	(18)	(225)	(272)	(515)	(27.1%)	1,387
2017	4,444	(45)	(134)	25	(154)	(3.5%)	4,290
2018	8,894	(98)	96	243	241	2.7%	9,135
2019	2,119	1,048	(172)	43	919	43.4%	3,038
Grand Total	**18,894**	**865**	**(610)**	**(446)**	**(191)**	**(1.0%)**	**18,703**

EXHIBIT G

Components of IBNR (i.e. "Undiscounted") Change During Month

RSP	**Nova Scotia**
AccountCode Desc	**IBNR - Undiscounted**

IBNR - in $000s

AccYear	Values Sum of Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation	Sum of Total Change	Sum of % Total Change	Sum of Current Month Final Amount
2007	(1)	-	-	-	-	-	(1)
2008	2	-	-	-	-	-	2
2009	5	-	-	-	-	-	5
2010	-	-	4	-	4	100.0%	4
2011	35	(1)	1	-	-	-	35
2012	305	(6)	12	(251)	(245)	(80.3%)	60
2013	174	(3)	3	(179)	(179)	(102.9%)	(5)
2014	(167)	3	(41)	(13)	(51)	30.5%	(218)
2015	410	(4)	(111)	(56)	(171)	(41.7%)	239
2016	1,426	(14)	(209)	(297)	(520)	(36.5%)	906
2017	3,755	(38)	(131)	(57)	(226)	(6.0%)	3,529
2018	8,005	(80)	102	28	50	0.6%	8,055
2019	1,923	960	(152)	(15)	793	41.2%	2,716
Grand Total	**15,872**	**817**	**(522)**	**(840)**	**(545)**	**(3.4%)**	**15,327**